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CREATIVE ART AND TRANSFORMATIVE DEVELOPMENT IN ARCHITECTURE NEXUS: A CASE OF FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

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Understanding design process through creative art that supports transformative development in Architecture is one process that needs to be carefully studied. This is because most studies the traditional studio practice of Architecture students focuses more in the end product of the design, without much attention given to the design process. However, creative art which is used in the design process constitutes an important avenue in the understanding of the transformative development of Architecture Students. This paper therefore explored the design process through creative art and how it influences creative thinking and problems associated with learning creative art that support transformative development of ideas in design process. In carrying out the study, Steven Temple's Bio-Experiential Model which emphasises is on the developmental relationship between concrete and abstract process of learning was adopted. The unit analysis was the students design works as well as their freehand creative arts, the Freehand Sketching practical drawing of year one and two was the data collected, the content analysed and the findings shows that there is a strong relationship between the flexibility involve in design process and the path that creative process follows in transforming ideas into concrete design. The findings therefore suggest that it is possible to improve confidence as well as reduce the fear to take decisions on individualistic design approach, style and technique. Most importantly is that the strategy will eliminate rigidity and copy- cat syndrome, hence produce master piece design. It is recommended that Freehand Sketching should be a core course throughout their year of study, in order to allow developmental transformation all through.

Keywords: Design process, Transformative Development, Creative process, Aesthetic, Concrete and Abstract Learning process.

INTRODUCTION

Art and Architecture have always been interrelated from time immemorial; art is the tool of communication in Architecture. Creative Art and Architecture were treated as one entity because both have to do with planning, designing and constructing form, space and ambience that reflect functional, technical, social, environmental and aesthetic considerations (Parsaee, Parva, & Karimi, 2014). To further buttress the relationship of Creative Art and Architecture, (Illies & Ray, 2009), define Architecture as the Art or Science of building or that branch of creative art which has for its object the production of edifices and ideas. And so, creative art provides an extended memory for visual images in the mind for more facile manipulation of ideas, and a principal medium of external thinking, they are necessary extension of a designer's cognitive capability, data representation, constrain propagation and mental simulation (Vanwindeken, Stilmant & Baret, 2013). (Seaman, & David(2000), also stated that varied conceptions are captured by Architect based on the way it is phenomenological experienced. Hence there is need to investigate the role of creative art and transformative development as it affects stages of conceptualization of ideas in design process in architecture.

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To ascertain the importance and its role in enhancing transformative development in design process. The primary phase of the design process, sketches (creative art), has a crucial role among the traditional mediums and is the elementary depictive action that is performed by designer's during the design process, (Farshad and Khairul, 2016). Garner (1990), mentions that sketching (creative art) fundamentally affects the development, creation, evaluation, and distribution of ideas. Moreover, Goel (1995) suggests that being "syntactically" and "semantically" unclear and ambiguous, the sketches (creative art) influence the heuristic, creative, open-ended stage of problem-solving.

Researchers like Fish and Scrivener (1990), Goel (1995), and Goldschmidt (1991) came to the conclusion that rough and untidy (sketching, (creative art) allows the designer to work quickly, suspend judgement on polished features. Moreover, it could help in generating new ideas. Therefore, this paper will explore the design process through creative art, and try to discover how it influences imaginative thinking that solves design problems associated with learning creative art that supports transformative development of ideas in design process for Architecture students. At the end of the research, it should be proved that there is a strong relationship between the flexibility involve in design process and the path that creativity process follows in transforming ideas into concrete design.

Theoretical Frame Work

Rudolf, in Arthur (2000), has argued vigorously that perception is a cognitive endeavour, that visual perception is visual thinking and creative art is a kind of visual problem solving. That means sensory perception is already cognitive in that it requires the perceiver to select, generalize, an aspect of the objects received by the mind, in order to create a particular design for either functionality or aesthetic purpose. Furthermore, Dilek, (2012), explains that drawing is recognized as the basic form of expression in creative art education. The methods associated with creative art and design, are mainly supported with formal features such as recreating the structure on two dimensional surfaces and use of visual components. However, the way visual information is processed in our mind is not clearly emphasized. Recognizing the objects, we see indicates a process parallel to the formation of images in the mind and perception of reality and comprehension. And this will help to show the way mind processes visual information in visual perception and cognitive structure.

In line with Daniel & Christopher (2010), he suggests that creative art don't merely imitate the statistics of the real world, but could prefer the usage of specific image statistics in producing a design. This result suggests an influence of early visual coding strategies in the production of design through creative art. This on the average possesses the same correlation structure as natural scenes. But Steven (2010), went further by saying that the first concrete experiences of student is an expression of a brain-based learning theory which is responsible for formulation of basic structures of sensory processing as a solid pathways. Therefore creates the structure and put into action form pedagogy of basic design courses that introduce creative process as a basis for learning design. And as such must put into cognisance these experiential, biological developmental relationships as important to developmental starting point for an appropriate basis for design pedagogy, which is a later more abstracted learning experience. Steven (2010) also produces a model explaining beginning design pedagogy on developmental relationships between concrete and abstract process of learning as a basis for transformative creative thinking that develops student's self-development (individualism). Which he (named (Proposal for Pedagogical Structure) based on Kolb's pedagogical model for studio education. Similarly, Piaget (1983), in his developmental learning theories, says that a basic tenant of this approach is that learning at the beginning level of direct experience, self- initiates brain changes which help students form their own structure of learning.

The individual technique and style which serves as a permanent format or pattern for learning experience. This makes decision-making consistent in relationship with biological interactivity between body and mind, concrete and abstract respectively, which initiates brain changes for creativity in design process. Going deeper in this explanation Kolb,(1984) and others, following Piaget in experiential learning theories identified concrete and abstract learning as fundamental poles for acquiring and taking decision on knowledge learning process. They agreed that concrete learning involves direct experiential engagement through heuristic discovery and reflection, which explain further that abstract learning involves indirect representational cues in acts of conceptualizations, synthesis and experimentation. Basic to Kolb's (1984) experiential learning model is that learning is thought of as a process whereby concepts are derived from and continuously modified by experience. Kolb (1984)

believes that "learning" is the process whereby knowledge is created through the transformation of experience. Ayuba, & Akpama, (2017), agreed that creating an outdoor learning and physical contact with the environment is an initiative that would incorporate genuine design principles that will help to develop student skill through cognitive, physical, social and emotional experience. This means that creating an outdoor learning helps to develop the power of imagination and creativity, which in turn lead to formation of a pragmatic conceptual design by generating and experimenting with new ideas that gives room for flexibility and manipulation of forms.

Transformative Development in Architecture

Through creative art (sketches), architecture students, in designing can discover and create diverse and more desirable functional forms by transforming previous images through techniques like visual addition, deletion, and modifications. Transformative skills in the form of freehand sketches appear to induce creative, explorative, open-ended environments that are conducive in dealing with the ill-structured nature of design activities (Farshad, and Khairul,2016). Therefore transformative development in architecture is the mechanism that shows the way new designs are generated from unambiguous representations and sustainable changes in form (Tovey, Poter, and Newman, 2003). In order to transform descriptions into depictions, the designer employs a set of quick sketches (creative art), by which the embodied themes in the architectural design are developed. Sequentially, this directs the designer to transform the former image through additions, deletions, and modifications (Tovey et al, 2003). Indeed, transformation moves from unstructured drawing to further detailed and precise illustrated representations. This means that design transformation is the progression from unstructured form to structured form which occurs for creating, modifying, and developing design elements and the design idea. Goel (1995) argued that design is the process from ill-defined problem to the well-defined design problems. It consists of some moves that start from the preliminary phase (unstructured sketch) and the refinement phase of design to detailed (explicit and precise design). This is confirmed by Goel (1994) that lateral and vertical is transformation, whereas duplication is repeating.

A lateral transformation is identified as movement from one idea to a slightly different idea. They are essential for broadening the problem space and the assessment and improvement of kernel ideas. A vertical transformation is identified as movement from one idea to a more detailed version of the same idea. It causes the problem space to deepen. Lateral transformations mostly take place in the initial design stages and are related to unstructured drawing while vertical transformations take place throughout the refinement and detailed design stages and are related to more precise and detailed design. Van der Lugt (2000) investigated features of design transformation that occur in idea links. He defined ideas as three sub classes in a link: supplementary, modification, and tangential links. The supplementary link shows auxiliary and small change on the same version of the idea; The modification link relates to changes in the structure of ideas, however keeping the current line of thought; the tangential link indicates a radical and fundamental change from the earlier idea. Van der Lugt (2000) also mentioned that a creative process consists of a balance among link types. Similarly, Rodger, Green, and McGown (2000) mentioned that the balance between vertical and lateral transformation results in a good design.

According to Kolb (1984), the process of experiential learning can be characterized as four-stage cycle involving four adaptive learning modes-concrete experience, reflective observation, abstract conceptualization, and active experimentation. Movement from stage to stage is a transformation of the other stages. He agreed that there are two distinct basic learning activities identified as opposing poles, in his experiential learning model, (perception and processing). At one end of the perception pole is concrete experience (apprehension, real, human, sensual, intuitive). Experiencing is immersing oneself in "doing" of a task. Not reflecting on the task, but carrying it out with intention. Opposing concrete experience is abstract conceptualization (comprehension, representations of experience, mental imagery). Conceptualization involves interpreting the events that have been noticed and understanding the relationships among them.

Design Process through Creative Art

Fashad et al (2016) observed that the whole process of design consisted of two groups of segments, the alone segment which they named the isolated segment and the contiguous segment which is set in one block named the dependency block. This shows that designers focus on previous thought and shift to an alternative topic, item, or space. Suwa and Tversky (1997) name these segments by means of focus-shift that corresponds to lateral transformation; in addition, with the exception of the initial segment, Suwa and Tversky (1997) name further segments located in the dependency chunk as continuing segments that relate to vertical transformation. O'Cathain and Howrie (1994) confirm that the design process is one of devising and experimenting, a process of rapid learning about something that doesn't yet exist by exploring interdependencies of problem and solution, the old and the new. Keith (2010) agreed that asking the students to reflect on how and why a building had been design in the way it had, proved to be a powerful aid in getting the students to consider the process undertaken. And Keith (2010) believes that design process is a reflective conversation that students will enter into if invited.

Lawson (2006:7) said that one of the weaknesses of the traditional studio is that students, in paying attention to the product of their labour fail to reflect sufficiently on their process." The assessment is one that concentrates and focuses on the product of the students' efforts, not necessarily the process. Therefore, the very real danger in the studio is that students will concentrate their efforts on the product- the end of project design- and in so doing ignore the development of the essential skills that aid them later in their careers. Fashad et al (2016) divided design transformation into four levels of detailing: diagrammatic, preliminary, refinement, and detail designing. These four levels could also be determined by decomposing the whole design process into three different components for analysing and measuring it: context, chunk, and move. Do el al (2000) stated that transformation can occur in design and context through manipulating shape and changing drawing types and viewpoints. He also confirmed that previous studies have classified context in the design process based on design development, the level of abstraction, and presentation types.

In the first type of context, Goel (1994, 1995, and 2014) categorized the development of design into four subcategories: (1) problem-structuring, which arranges the problem, (2) preliminary-design, which creates some solution options and idea cores, (3) refinement-design, which improves the current sketch by transformation, and (4) detail-design, which presents the design product. Similarly, Abdelmohsen and Do (2007) classified season of design into three phases. In the first phase, several solution options are created in schematic plan drawing. In the second phase, designers refine and improve options. In the third phase, they improve refined drawing to the product of design and organization elements. Although diagram has an important role to play in design thinking and sketching types, design development of Goel do not include diagrams. For Goel, diagrams are more related to form conceptual design. It seems that it may however be more useful to add diagram to design development.

The second type of context is the abstraction level. Designers use abstract diagrams and unstructured forms in early phase of the design process, while they utilize detailed and structured representations in later phases of the design process (Purcell and Gero, 1998). Fish and Scrivener (1990) categorize the element of pictorial representation from depiction to spatial depiction and argue that sketch has an essential role in supporting the mind by interpreting the descriptive propositional information to depiction. Goel (1995) in "Sketch of Thought" mentioned that the design process contains some movement from ambiguity and vague shape, which is important in the early phase of design to more structure form in detailed design. Consequently, this is a process of developing from unclear sketch to detailed form; he notes that the design transformation process moves from abstraction level to convention document. Goldschmidt (1992) recognized that chunk consists of some moves and the relationships between them. She define chunk as "the block of links among successive moves that link exclusively among themselves and are barely interconnected with other moves", and restricts chunk according to design moves with the large number, whereas Suwa and Tversky (1997) structured them based on segments with the smaller number.

It is agreed that Chunk is often used in linkography, as opposed to other methods. Goldschmidt (1990) decomposes the design process into small parts of "design moves" by using linkography. He define a move as "a step, an act, an operation, which transforms

the design situation relative to the state in which it was prior to that move'' or can be separated as '' the smallest coherent operation detectable in design activity. He mentions that considering design move can result in analysing and assessing the design process. Moreover, Goel (1995) defined three design movements: vertical and lateral, which are transforming, and duplication, which is repeating. Goldschmidt (1991) determined a segment as design move, which is defined as '' an act of reasoning that presents a coherent proposition pertaining to an entity that is being designed''. Which means a change in the designer's thought contents, and their action, and their intention in a subject for the sign for the start and the end of the new segment. This clearly shows that different designers will fall into any of these basic categories, confirming that individual student's proceeds in their design from different point of view show casing individual technique, style and approach which is informed by their personal experience and it varied from one student to another.

Experiential Learning Process

It is a conjecture of a brain-based learning theory that a student's direct, concrete primary experiences are responsible for the construction of fundamental structures of neural processing as ''hard wired'' pathways. These structures then form the ground of and set into play patterns of later more abstracted learning experiences. Pedagogy of basic design courses that seeks introduction of creative processes as a foundation for design education must recognize these experiential, biologically developmental relationships as basic to developmentally appropriate beginning design curriculum. Steven (2010).

Aligning with developmental learning theories (Piaget and others), a basic tenant of this approach is that learning at the primary level of direct experience self-initiates brain changes where students form their own structure of learning. Thus, initial learning experiences will be those that best enable decision-making consistent with the biological interactivity between body and mind, between, respectively, the concrete and the abstract. This is important because the designed environment in which we all live is grounded in the development of abstract content experientially based in concrete material physicality Steven (2010).

Klob and others, following Piaget) identify concrete and abstract learning as fundamental poles for acquiring and acting on knowledge: Concrete learning involves direct experiential engagement through heuristic discovery and reflection and abstract learning involves indirect representational cues in acts of conceptualization, synthesis, and experimentation. Basic to Kolb's experiential learning model is that learning is thought of as a process whereby concepts are derived from and continuously modified by experience. Kolb believes that, ''learning is the process whereby knowledge is created through the transformation of experiences. Steven (2010) also proposes a cycling of concrete material experiences and abstract learning experiences into an interactive transformational interdependence as a model of creative design processes that engages student self-development toward maturation. Working through direct experience, within the material, sensorial realm, enabling discovery and manipulation of a material's '' workability '' in uncovering design ideation.

Concrete investigations become balanced, thus building lessons of abstraction upon lessons of concrete experience. Abstraction includes such issues as diagramming, analysis, visual thinking, representational devices such as drawing, modelling, simulation, scale, context, use of narrative and metaphor, and the nature of ideation. He agreed that theorizing conceptual approaches and developing experimental proposals in which concrete experience and reflective observation are implicitly engaged as raw material of creative, abstract thinking. By engaging in design processes as structured concrete and abstract creative discoveries, and students build on experiential dynamic of making-thinking-doing-reflecting to actively make sense of creativity in design. That means primary experiences in which college students first engage similarly form basic structures of neural processing, and these in turn, inevitably and profoundly form mechanisms of learning for successive educational experiences. He also agreed that the brain, as the hub of the nervous system, is experienced as the seat of consciousness in the abstraction of mind but because our nervous systems have their origin in our bodies as our bodies establish a relationship to the physical world. That it is the body in concrete relation to the world that provides the basis of nervous transformations. He also believes that the biologically formative nature of concrete experience casts initial learning experiences as those that enable self-initiated decision-making consistent with the biological interactivity between body and mind, between,

respectively, the concrete and abstract. He proposed that education psychology identifies concrete learning and abstract learning as two opposing yet complimentary and fundamental means for acquiring and acting on knowledge.

He finally emphasized that concrete learning methods are facilitated by immediate experiential contact in which there is direct engagement through heuristic manipulation and discovery, followed by reflective observation and judgment. Abstract learning involves mental mechanisms and cognitive comprehension utilizing indirect representation cues and symbols in acts of conceptualization, synthesis, and experimentation, these helps in interactive cycling of concrete and abstract modes that forms the basic staging of learning and pedagogy.

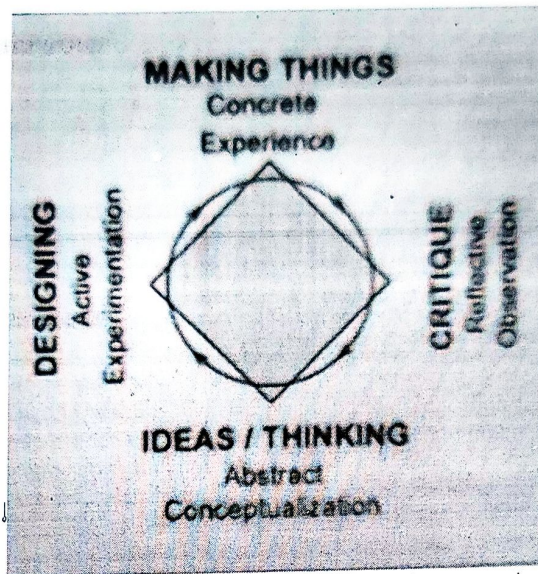


Figure 1: Proposal for Pedagogical Structure.
Source: Steven Temple, (2010).

APPLIED METHODOLOGY

The conjecture of brain-based learning theory of Steven,(2010), Piaget,(1983), Kolb(1984) and others that a student's direct, concrete first experiences are responsible for the construction of fundamental structures of neural processing, nerve strands that serves as connecting pathways, which then creates the foundation and arrange into play patterns of later developed abstract learning experiences. And that it should also be the basis for the beginning design learning through creative process which introduces transformative, experiential, developmental and biological relationships between concrete and abstract process. It is this procedure that eventually introduce self-initiates brain changes which help the best decision-making consistent that culminate into creation of individual technique and style.

In applying this model of Steven temple,(2010) to the pedagogy of learning design process through creative art that support transformative development in the department of Architecture, Federal university of technology Minna, there is the need to first show how Creative art (freehand sketching), it's been taught before the application. Freehand Sketching is a course that helps to develop the skill of drawing, creative thinking and sense of imagination, it is also the tool of communication in architecture with this skill individual technique of each student is develop to the point of individualization. In the first semes ter of the first year, the students of architecture take this course called Freehand Sketching 1 (Arc 114), and Freehand Sketching 11 (Arc 124) in the second semester, Freehand Sketching 111 (Arc 214) is taking during First semester of the second year of learning while Further Freehand Sketching (Arc 227) and Further Painting (Arc 229) are both elective courses in the second semester of the second year.

It is believed that most of the new student don't have the knowledge of drawing, that is what informed the teaching from known to unknown (from simple to complex), and as such after the introduction to Freehand Sketching, they go out for the first practical drawing which is

drawing of objects that have basic shapes like square, rectangle and circle for example dustbin, water tanks, and generator house.. Because this is the rudiment of drawing that is the tool of design it is believed that every building design, if broken to parts will conform to a basic geometrical shape. In the second semester of the first year the students are expected to develop their skill further by introducing them to perspective drawing, rendering, landscape and objects in landscape, which allows them to join and combine different geometrical shapes and forms to create realistic drawing. all this while students have not started design it is expected that by now students already have a style and technique of drawing and rendering which is peculiar to individual in its early stage of development.

It is this skill that student carry along with them when they now start architectural design for the first time in their second year of learning, at this level students are expected to be able to transform their skill of drawing to another level by producing solid building forms and the environment in photographic representation. This is the stage where students are expected to exhibit optimal skill in representing realism as it were, because at this period they already started the main course which is Architectural design (Arc 211), it is expected that students should be able to approach design at this stage fully prepared having pass through the rudiment of Freehand Sketching such as, use of space, spatial arrangement, proportion, balance, use of line, different types of shading, different types of rendering, perspective, colour and techniques of achieving three dimensional effect which makes design looks realistic. They have gone outside to draw from what exist which is nature and reality they will now apply their experience in design using imagination to create what does not exist. This is introducing transformative, developmental and biological relationships between concrete and abstract learning process. The individual student now exhibit their unique style and technique in executing the design work, this is because the way each student experience is different and those first outside drawing experiences are responsible for the construction of fundamental structures of neural formation that serves as connecting pathway, which then creates room for later transformation of transitional development of abstract into reality. This is why every work will always come out differently.

The study was conducted by analysing the work of a particular student from the beginning of freehand sketching till the final stage of the drawing course, namely Arc 114, Arc 124, Arc 214, Arc 227 and Arc 229. This will enable the researcher to determine the transformative development that took place during the drawing courses. To take more than a student work for analysis will not be suitable for this research, because each students work will be analysed and the space given for this article will not be adequate for that so that was the justification for the unit analysis. These works shows the different stages of developmental relationship from the beginning of drawing class to the final stage.

DATA ANALYSIS

At this stage the student experimented by sketching an idea down from reality with time the sketch improved by continuous observation from the environment and imaginati on this is a stage of exploring different styles and technique to arrive on an agreeable sketch. It is the foundation of the work, whereby it serves as a guide for further development every other development proceeds from here. Although changes can be made at this stage, but the basic shape of the object is priority.

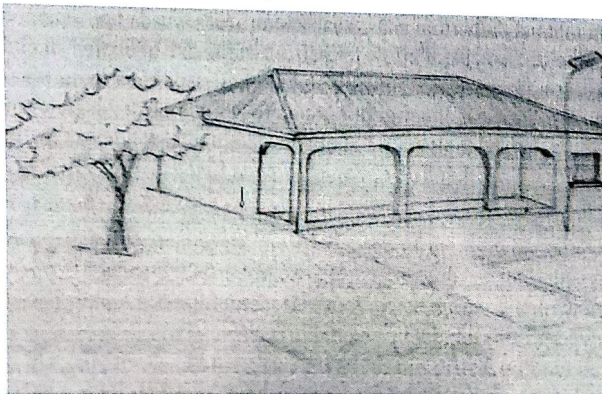


Figure 2: Arc 114 early drawing- stage (Sketch)

At this stage the artist improved on the drawing by transforming the sketch into a full fledged photographic representation. This is the stage where the artist can showcase and manipulate its technique and style in order to achieve individualism, this is the transformative stage.



Figure 3: Arc 114 second stage of development

This is one point perspective where the artist exhibited the skill of imagination to achieve three dimensional effects of distance and solidity, photographic illusion.

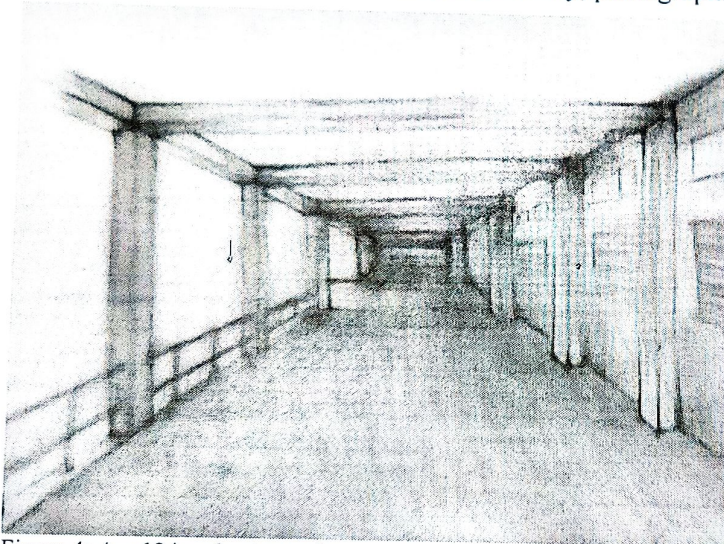


Figure 4: Arc 124 early stage of perspective drawing

This is another version of one point perspective, rendered with a different style and technique.

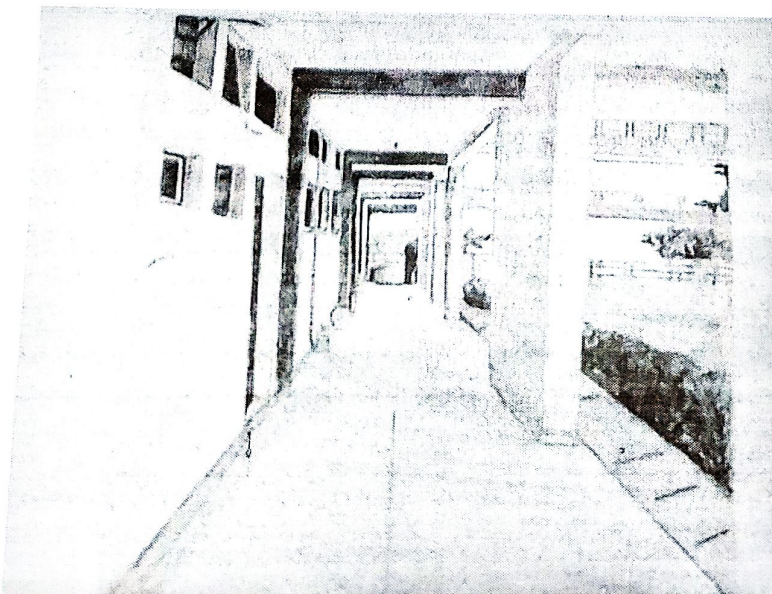


Figure 5: Arc 214 second stage of perspective drawing

This is an advance stage of drawing where colour is used to render the work in photographic realism. At this stage the artist exhibited a sense of creativity by bringing all the skill acquired during the preliminary stages to bear on this advance stage.

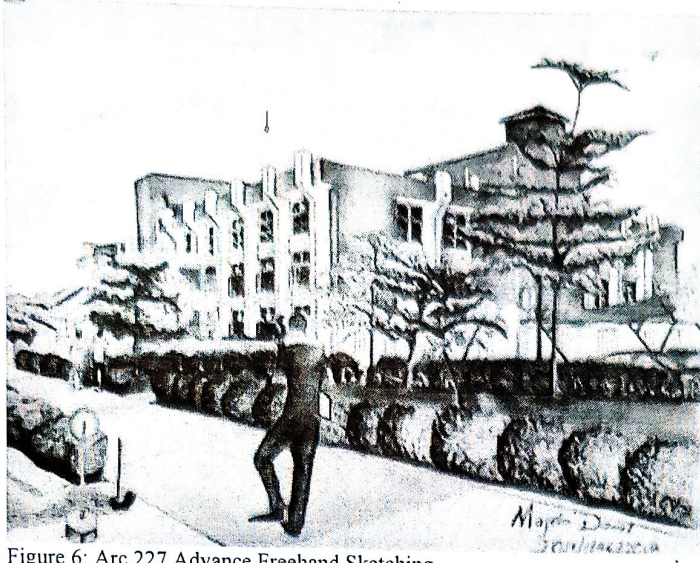


Figure 6: Arc 227 Advance Freehand Sketching

This is another version of the final stage, where paint is used to render a photographic representation of an existing building (the Agricultural building), the style is simple but explicit by exhibiting colour harmony and total control of rendering. This is the final point of rendering where transformative development and high level of creativity is exhibited.

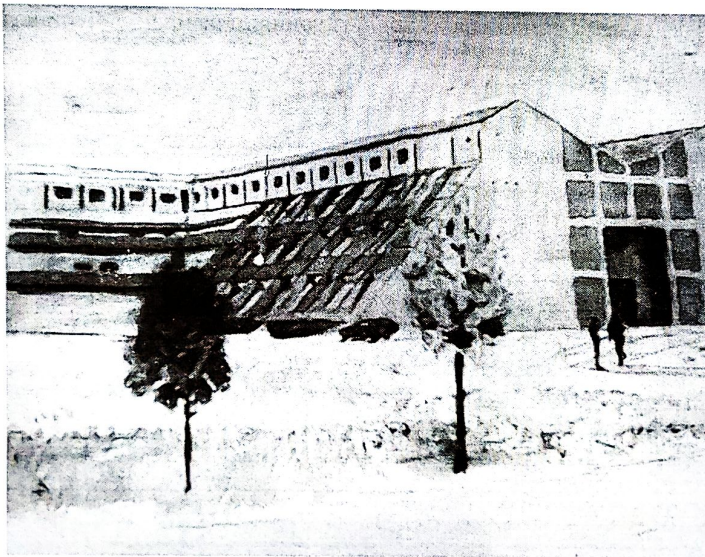


Figure 7: Arc 229 Further Painting

FINDINGS AND DISCUSSION

It was discovered that it is possible to improve confidence as well as reduce fear to take decisions on individual design approach, style and technique. Because the more they draw the better they become in the mastery of their technique and style and so eliminate rigidity and copy-cat syndrome.

It was also discovered that they are able to develop their drawing to the final stage without necessarily seeing the model in question, because drawing out door has helped in recording the picture in their mind and by means of imagination the work is completed.

It was also discovered that working together outdoor, gives room to flexibility of style, ideas and technique due to freedom of interaction with pair group that influences the outcome of the design positively.

It was observed that competition also come to into play whereby every student want to outdo the other, and as such develops more confidence as they advance in drawing and so discovery of new style and techniques is ensue through experimentation and perfection of skill.

The question now is when does this structure of learning takes on form? It is discovered that students of architecture exhibit some features in design showing that the outcome of the final work is determined by multiple experiences, for the design input to be unique and new it is the combination of different experiences of which is not just one and not at a point in time but, at a different point in time with different environmental experiences that exhibits different points of view. So if this is the case it could be agreed that student's direct concrete first experiences are responsible for the construction of fundamental structure of neural processing that creates the basis and set into play patterns of later developed abstract learning experiences but that it should also be the basis for the beginning learning process that introduces transformative, experiential, developmental and biological relationships between concrete and abstract learning process may not completely be true. This is because with time later experiences might usurp the first arrangement and at the end change it completely because of factors like change from traditional studio practice to computer graphics, change in environmental factors like settings, maturity of developmental skills and techniques, peer influence and experimentation that leads to accidental discovery, these factors will definitely change the students view and as such depart completely from its original or early developmental structure.

CONCLUSION AND RECOMENDATION

Without the knowledge of transformative development, students of architecture will find it difficult to produce a convincing design that is pragmatic and at the same time aesthetical in nature. It is believed that with the pedagogy of learning creative art that helps to set in place a way of improving design process which is freehand sketching (tool of communication in architecture) should be giving more attention, especially in the transitional development of the skill of drawing which can be achieved by continuous practice from one level to another. From the works analysed in this research it is observed that from the first stage of drawing students are allowed to form and create their own method of approach which gives room for creativity and as such they will be able to transform their idea without fear of failure. The outdoor experience of the early stage drawing gives the freedom to choose and explore different technique and style and at the end of exploration, individual student must have to choose which of the technique and style of rendering is suitable for his mode of expression. This actually differs with individual student, this is because their experience differs and as such proffers solution to design and drawings with diverse approach. At the peak of drawing experience that is when architectural design begins, that means student will transfer their experience acquired from drawing class into design. For ultimo result Arc 227 and Arc 229 which is the final stage of drawing should be made to be core courses not electives as they are now been taught so that the final experience acquired can be transferred to design. Or else students that stop along the line without completing the final stage may not perform to their ultimo best.

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