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Architectural Design and Learning Theories – Pedagogical Strategies

Aparna Tarar

Assistant Professor, Priyadarshini Institute of Architecture and Design Studies, Nagpur, Maharashtra, India
E-mail: tararaparna7@gmail.com

Abstract—*An architecture educator needs to deal with many issues while teaching. Architecture design studio is the primary space where budding professionals explore their creative skills, which are so prized by the profession. In psychology and education, learning is commonly defined as a process that brings together cognitive, emotional, and environmental influences and experiences for acquiring, enhancing, or making changes in one's knowledge, skills, values, and world views. The conventional approach to design education follows teaching techniques that are completely different from the realities of design in practice. In design studio, the students develop a solution without investigating, identifying or even understanding the problems to be solved. Design as an application in the studio should be grounded on theories that should be tested with respect to the problem at hand. Experiential learning has a significant role in basic architectural education in developing subject knowledge among untrained individuals. Experiential learning is a powerful teaching tool. While classroom lectures primarily address the cognitive domain, experiential learning involves the whole student: their cognitive, affective and physical domains. The result is that students can relate to the subject matter in a way that is meaningful to their own lives. Experience-based projects offer a change of pace from traditional classroom assignments and facilitate learning for students with a variety of learning styles. Application of learning theories through different pedagogical strategies such as application of design theories in design studios, study tour documentations, construction yard activities (participatory learning), model making etc improvises the learning abilities.*

Keywords*: Architecture pedagogy, Architectural Design, Experiential learning Theory, Participatory learning.*

1. INTRODUCTION

Learning can be considered as a process that involves the whole experiences of an individual influenced by different factors such as distinctiveness, educational environment, social environment, skills, abilities etc. Although learning is mainly a student-centered, the attitudes of instructors, the curriculum goals and the conditions of the learning environment are also very effective in the process. Thus learning can be defined as the outcome of an individual who is constantly active and interactive with her/his environment. Hands on activities, stage wise inputs and a framed design process may give better outcomes. Students learn the design process more efficiently with the self involvement, self experiences. Application of some creative exercises or methods helps them to learn or experience the methodology by doing it.

2. ARCHITECTURE PEDAGOGY

Architecture education is one of the most distinctive branches of education, which requires various capabilities. The subjects included in architecture curriculum can be broadly divided into three types of subjects,

1. Skill related subjects, e.g. Visual arts, Graphics etc.
2. Knowledge related subjects, e.g. History, Climatology, Building services etc.
3. Application related subjects, e.g. Design, W.D. etc.

All these three types of subjects need to adopt different methods of teaching. In some subjects we need to proceed from the simple to complex. Each branch of instruction must proceed from the empirical to the rational. But for skill and creative subjects, students needs to be told as little as possible and induced to discover as much as possible through self-instruction, self- experience.

3. ARCHITECTURAL DESIGN

Design is an important subject in bachelor of architecture course. It is the primary space where budding professionals explore their creative skills, which are so prized by the profession. Teaching architectural design has been criticized in the last three decades. The conventional approach to design education follows teaching techniques that are completely different from the realities of design in practice. In design studio, the students develop a solution without investigating, identifying or even understanding the problems to be solved. There is a definite process involved in creation of architecture. Right from the movement when the thought of a requirement of a building steps up in the mind, till it is finally complete there are various steps involved, which are the parts of the process. The rigid format that has been established and

followed till date will have to be loosened up. The design process should be organized accordingly as a procedure to solve problems stage wise. Design is a reiterative process of analysis, design, evaluation, redesign and re-evaluation. Design process has been studied for quite a long time. Many theories have expressed their views on design process. Many conferences and societies were formed for research work. The consensus was on design process to be a problem solving procedure, with a three phase sequence of,

Analysis ⟹ Synthesis ⟹ Evaluation

Final product of the design is too assumed by the designer before the means of achieving it can be explored. There are certain common steps necessarily involved in any type of design, though the emphasis may differ.

- Acquiring knowledge
- Setting objectives
- Counter checking
- Implementing

There is a definite process involved in creation of architecture.

4. EXPERIENTIAL LEARNING THEORY

Experiential learning is a process through which students develop knowledge, skills, and values from direct experiences outside a traditional academic setting. Learning that is considered "experiential" contain all the following elements:

- Reflection, critical analysis and synthesis
- Opportunities for students to take initiative, make decisions, and be accountable for the results
- Opportunities for students to engage intellectually, creatively, emotionally, socially, or physically
- A designed learning experience that includes the possibility to learn from natural consequences, mistakes, and successes

Experiential learning is a well-known model in education. Kolb's Experiential Learning Theory (Kolb, 1984) defines experiential learning as, "The process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience."

The experiential learning is learner centered. That is to say it cares for the needs, and wants of the learner. Carl Roger's has tried to enumerate these qualities of experiential learning in the following ways:

1. Experiential learning is characterized by personal involvement of the learner.
2. It is self-initiated.
3. It is characterized by self-evaluation.
4. It leaves a pervasive effect on the learner.

4.1 Kolb's Experiential Learning Theory presents a cycle of four elements

Concrete Experience

Reflective Observation

Abstract Conceptualization

Active Experimentation

The cycle begins with an experience that the student has had, followed by an opportunity to reflect on that experience. Then students may conceptualize and draw conclusions about what they experienced and observed, leading to future actions in which the students experiment with different behaviors. This begins the cycle anew as students have new experiences based on their experimentation (Oxendine, Robinson and Willson, 2004). Although this continuum is presented as a cycle, the steps may occur in nearly any order. This learning cycle involves both concrete components (steps 1 and 4) and conceptual components (steps 2 and 3), which require a variety of cognitive and affective behaviors.

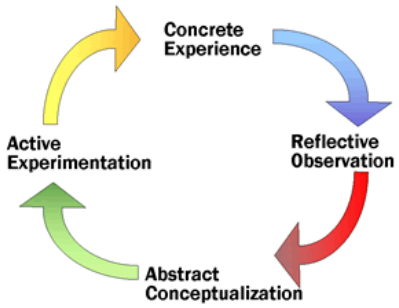

Figure 1: Kolb's Cycle of Experiential Learning

4.2 The Essential Components of Experience-Based Learning

Andresen, Boud and Choen (2000) provide a list of criteria for experience-based learning. The authors state that for a project to be truly experiential, the following attributes are necessary in some combination.

The goal of experience-based learning involves something personally significant or meaningful to the students. Students should be personally engaged. Reflective thought and opportunities for students to write or discuss their experiences should be ongoing throughout the process. The whole person is involved, meaning not just their intellect but also their senses, their feelings and their personalities. Students should be recognized for prior learning they bring into the process.

Teachers need to establish a sense of trust, respect, openness, and concern for the well-being of the students.

The attempt of the teachers in realizing the objectives of experiential learning are as follows:

- Arranging a favorable and positive climate for learning.

- Helping the learner to have a clear cut objectives and purpose of his / her learning.
- Organizing the learning resources and making them available to the learners.
- Balancing intellectual and emotional components of learning.
- Sharing feelings and thoughts with learners in a democratic way.
- To facilitate learning.
- He /she are to be properly helped, guided and kept on the proper track by the teacher as and when the need of doing so arises.
- To help the learner realize the importance of significance of the learning task.

The learning style preferences resulting from the two bipolar scales of the learning cycle were described by Kolb as accommodating (AE/CE), divergent (CE/RO), assimilating (RO/AC) and convergent (AC/AE). These four different learning styles were labeled according to the individuals' preferred information perceiving and processing modes. In other words, the place of any individual both in the vertical and horizontal axis represents the exact learning style of that individual. Each learning style has its own strengths and weaknesses but that does not mean that one is better than the other.

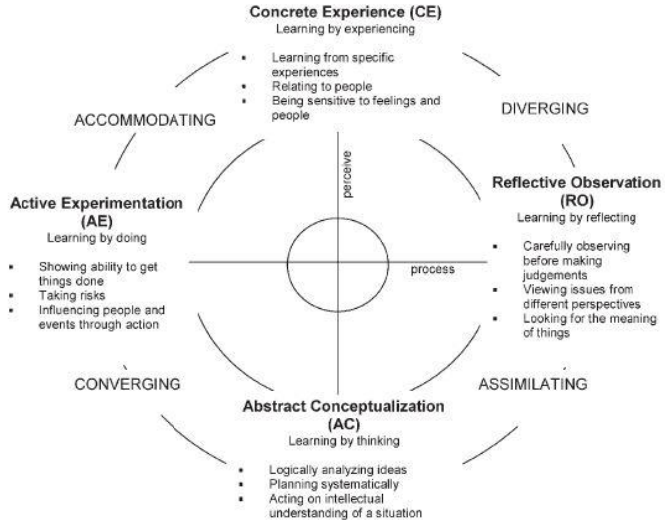

Figure 2: Four learning modes of Experiential Learning Theory

5. CASE / EXAMPLE:

5.1 Design Studio for 2nd year B. Arch students

Objective: To let students know, how building circulation and movement patterns helps in generating built spaces, with the help of different circulation elements.

5.2 Design task

To design a nature's museum following a movement pattern for botanical garden of Nagpur city, near a lake. Design different viewpoints with pauses in movement pattern to explore the surrounding. The design should connect the inside with the outside along the entire movement route with different circulation elements. The generated spaces could be open, semi open or covered.

5.3 Design Process:

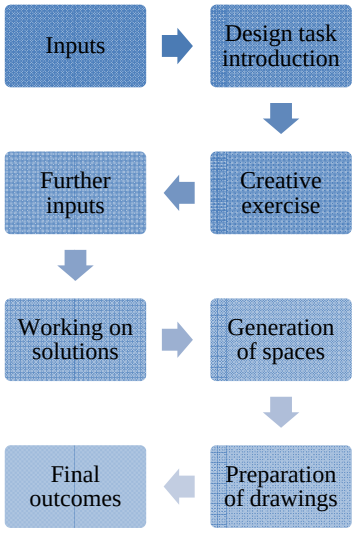

Figure 3: Basic Design Stages

Figure 4: Students working on Design models (Source-Author)

Concrete Experience: Students thoroughly read the design brief and the requirements. Also they had referred some case studies for more understanding. They worked on a creative exercise for generation of 2D plan form.

Reflective Observation: Worked on different options for planning as per the required activities.

Abstract Conceptualization: Finalized one option and worked on given design considerations, to follow the context and typology.

Active Experimentation: Actual worked on 3D model out of 2D plan form.

Table 1: Design Process

Stages	Input from the instructor	Expected out put
1.	Inputs in the form of ppt and sketches. Introduction of circulation and movement.Different circulation elements. And how it generates built spaces.	Students will identify different architectural and non-architectural examples of circulation.
2.	Inputs about site, requirements, generation of movement pattern and spaces.	Generation of ideas, identification of different circulation elements.
3.	Explaining creative exercise, it's use in defining movement patterns.	Students will try to find out solutions in 2d and 3d.
4.	Inputs about other considerations in designing i.e., Levels, pauses, connectors, principle of continuity, suspense creation, generation of spaces. Etc.	Students will identify the examples through their experiences and apply it in designing.
5.	Explaining about the changes in generated path according to considerations.	Students will finalize the path with necessary changes and plan spaces accordingly.
6.	Inputs about different alternative solutions.	Students will try on spaces, levels and connectors
7..	Explaining for drawing requirements in the form of conceptual plan, section & sketches.	Students will prepare drawings as per concepts.
8.	Transform outputs from the creative session and sketches into 3-d forms/models.	Models as the final outcome

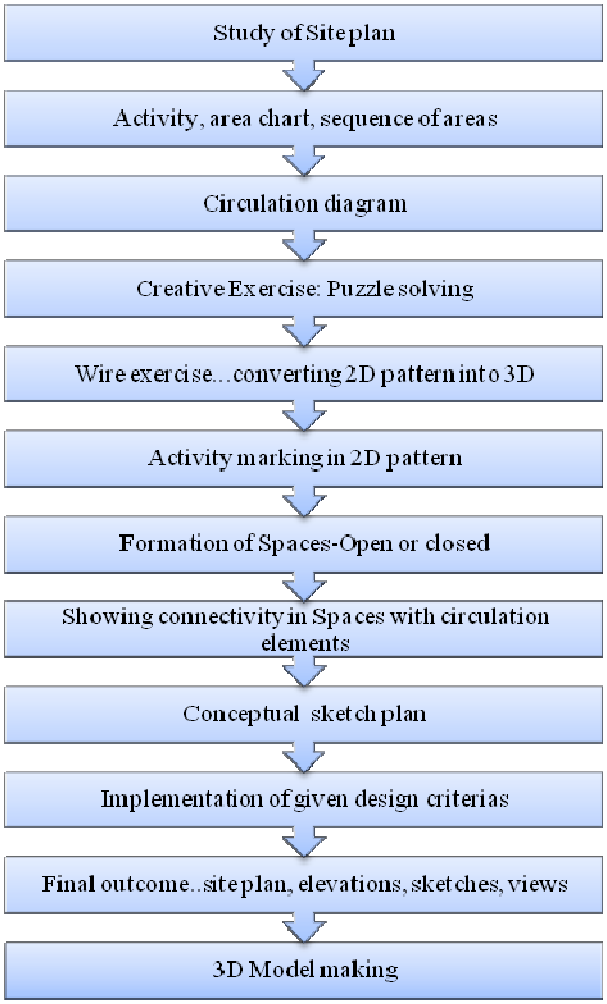

Figure 5: Studio working stages.

Figure 6: Final outcome of students (Source-Author)

6. CONCLUSION

Experiential learning is a powerful teaching tool. While classroom lectures primarily address the cognitive domain, experiential learning involves the whole student: their cognitive, affective and physical domains. New concepts and issues in designing encourage the students to work in a new way. Systematic framing of design stages does not create confusion, and step wise solutions results in better understanding and outcome. Model making exercises help students to compare the generated built form out of 2dimentional plan form. Creative exercises in design process, act as a trigger to start a thought process, and also enhance the working environment. Experience-based projects can help bring the students and the teacher closer together. Because they are sharing aspects of their own actions and decisions, there is a personal element to this type of learning.

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