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Learning Architecture through Experimentation

Prof. NehaKolhe
Assistant Professor, Priyadarshini Institute of Architecture and Design Studies, Priyadarshini Campus, Digdoh Hills, Hingna, Nagpur

Prof. AparnaTarar
Assistant Professor, Priyadarshini Institute of Architecture and Design Studies, Priyadarshini Campus, Digdoh Hills, Hingna, Nagpur

Abstract
Experiential learning and hands on education have a key role to play in the education of planners, architects, engineers and builders of the future. Experiential learning seems to have a significant potential in basic architectural design education to raise spatial awareness among untrained individuals. It is assumed that education can bring about change , by changing conventional teaching into a teaching that ends primarily at enhancing attitudes and skills for the better understanding and perceiving of the built environment, enhancing attitudes and skills of communication and team work, and preparing students for a lifelong learning process. All that can be achieved through applying experiential learning.
Objective of this paper is to present, an understanding of experiential learning as the discipline in which the learner prefers to learn actively, through hands-on experience.
Learning occurs at the same time as the doing. It is almost as if, out of awareness, the learner reviews what he/she has done, and stores the knowledge or skills somewhere in her experience. This paper intent to exhibit the work done by the students of Priyadarshini institute of architecture and Design studies, a hands on experience to learn from.

Keywords: Experiential learning, hands-on experience, learning process, change maker project.

Introduction
The theory of experiential learning has been proposed by Carl Ransom Rogers, an American psychologist. It was primarily employed to explain the learning mechanism, of adult learners and then was applied to adolescent and school going learners also. In his search for the basic nature of learning, Roger's tried to distinguish two types of learning- cognitive and experiential. He termed cognitive learning as meaningless in itself unless it is subjected to some use. Such learning is knowledge based and does may include the learning of vocabulary, multiplication table, mathematical formulae, historical events and geographical facts. The experiential learning on the other hand is quite vital to ones progress and welfare. It is associated with the application of the acquired knowledge such as learning about engines in order to repair a car, learning psychological principles and methods in order to help the children get rid of bad habits.
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.

The cognitive sciences input David C. Kolb once defined experiential learning as an education based on dialectical coupling of practical experience and critical analysis leading to abstract conceptualization: "Experiential learning is the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience".
Learning can be considered as a process that involves the whole experiences of an individual influenced by different factors such as his distinctiveness, educational environment, social environment, skills, abilities, and 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. Learning is contextual; it takes place in a social context.

Experience based learning
What is experiential learning?
Experiential learning is a process through which students develop knowledge, skills, and values from direct experiences outside a traditional academic setting. Experiential learning encompasses a variety of activities including internships, service learning, undergraduate research, study abroad, and other creative and professional work experiences. Well-planned, supervised and assessed experiential learning programs can stimulate academic inquiry by promoting interdisciplinary learning, civic engagement, career development, cultural awareness, leadership, and other professional and intellectual skills.
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."

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.

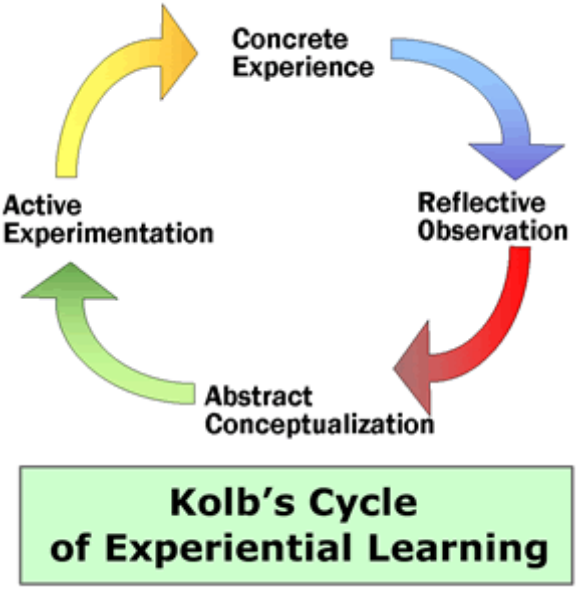


Figure 1: Kolb's Cycle of Experiential Learning

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 and the parents 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 labelled 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.

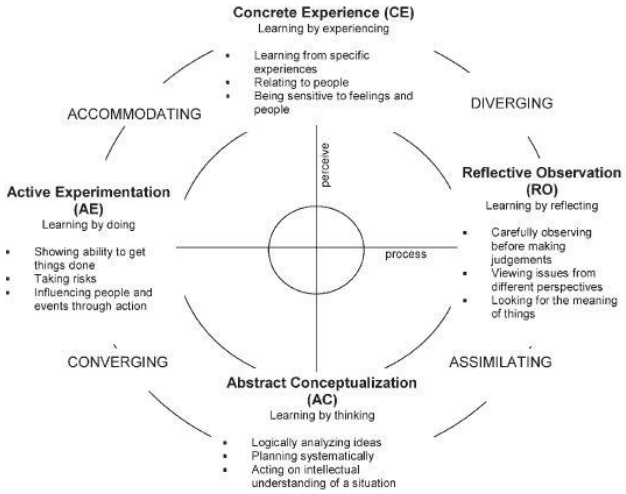


Figure 2: Four learning modes of Experiential Learning Theory

Why experience-based projects in Architecture Education?

- 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. Students that struggle with writing papers and completing assignments may find themselves re-engaged in the course with the help of a project that draws from their own experiences. Even students who are high achievers in traditional assignments often appreciate an original format.
- Projects like this have a **lasting impact**. In a survey given to students 1-3 years after the Lifestyle Project at Skidmore College, 81% of the students reported that they had made permanent changes to their lifestyles as a result of the project [Kirk and Thomas, 2003] .
- 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. This can be a valuable way for instructors to get to know their students, and for students to pull together as a team.

EXAMPLE: The change maker's project

Design task: The project taken up by the students of Priyadarshini institute of architecture and Design studies, hands on experience to learn from started with site selection.
The task was to design a P.U land in Friend's colony, Katol Road Nagpur which was underutilized and was used as a dumping yard by the society.
The design objectives given to the students for designing were

1. sustainable, economic and quicker
2. Recyclable, reusable material integration – on the site, around the site!
3. Sustainable measures of development
4. Inclusive Park with knowledge an interaction for kids as well as adults.

Our major aim was to transform the waste land/ underutilized open space, trapped in the rapid urban development of residential sectors. Each of these under- used spaces has a unique character of their own and each can be contextually developed through place-making principles of designing.

The site chosen lies within the locality of the residents in friend's colony, which also has a slum abutting alongside. The residents when approached for the first time, by the college students with the proposal to make their waste land into a playing area for their kids showed mixed reactions; Some skeptical to the abilities of the students to complete the task by their promised sustainable materials, some warming up to the idea of participating in the process themselves and some enthusiastic to witness the change for their kids.

The beginning:
The very first step towards dealing with the given task was to ensure that all site types were explored and finally being narrowed down to the very basic element with the help of guidance from the stake holders. The spaces which have been neglected throughout our city Nagpur were properly studied and their defaults and merits were understood. The very common fate for all open – underused spaces was met by becoming a garbage dump and being degraded into a waste land, which could no further be utilized for any purpose.

The meeting with the NMC commissioner:
The commissioner of Nagpur Municipal Corporation was very intrigued by the initiative taken by the architecture students in developing the urban context. As he is quoted saying "the large scale projects which enhance our public areas in the city have been taken up for development and are noticeably changing, while the spaces which are not noticeable and are in direct relevance with the citizens are neglected and thus have a greater potential to have immediate impact if worked upon."

The community interaction:
The chosen site in the neighborhood of "friend's colony" was selected as a result of great scrutiny. The site is surrounded by various independent households. The people surrounding the site were consulted in a community meeting to arrive at a certain requirement of the site which could be inculcated onto the unused space. In conclusion, the space was decided to be converted into a children's interactive and inclusive park.
People responded with positive comments, helping hands and enthusiasm to re build their environment. There were skeptical

reviews also but as time passed and the efforts of the students gave a different look to the society, everyone joined hands to support the cause. The materials and ideas alike were communicated to the students and work began on the site:
The site was first cleaned of the debris and recyclable waste materials. Bricks, stones and other useful building materials were segregated and preserved for further use on the site. Stone and brick pieces were joined with the help of adobe to create steps at the entrance to the site.

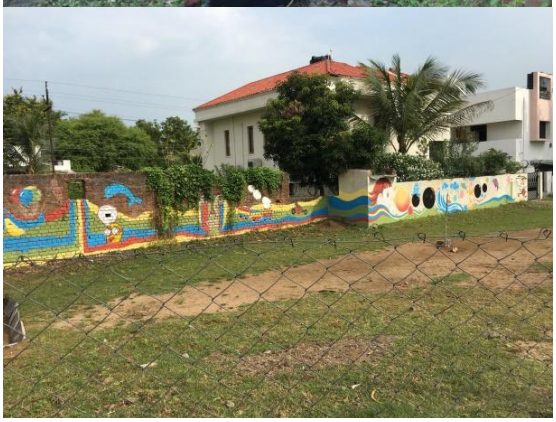
Problems identified on site:

1. No defined access to the space
2. Hindrance due to stray animals.
3. No space defined for children or elders
4. Growth of weeds
5. The garbage was thrown on the ground.
6. The fences were either broken or twisted by the trespassers

Material Procurement

To make the solutions more sustainable, economic and quicker the materials used for the development of the space were waste materials which was available around the site like broken bricks, stones, brick bat coba, tiles and stone slab waste from construction sites around. Used tyres were available in large scale around the site which was used for the solution to beautify the site and create seating and games for kids.

Solutions to the problem



Painting of the wall:

The blank white wall lining one of the sides of the land was turned into a vibrant and colourful wall with the help of the children of the community.

Lining of the pathway:
The pathways were lined and leveled with colorful stones, tyres and tiles which invoke participation from the people such as – "walk" , "water the plants" , "A, B, C," etc. have been included for knowledge and interaction.

Play area for children
The play areas which had been designed by the students were tactfully thought of, to improve the physical as well as mental activity amongst the children. These include the "maze of tyres" which was created by burying tyres vertically into the ground halfway through. This game was enhanced by tying of ropes across the pathway of the route for children to find ways to cross over and under the ropes. The center of the maze holds a very innovative installation made out of waste plywood, PVC pipes and metal sections which held LED lights in position. This interactive play area includes a placard which asks the children to gather various materials and further beautify the tree. Not only are they children made to think creatively, but also their physical activity is catered to by means of this maze. Another play area which has had a great response from the kids is the "monkey bar". Made out of timber posts creating a cubical frame, many colouredtyres hang from the ropes.

Tree plantation:
75 plants in all have been planted and their care is being taken by the community at the moment.

Plank Installation:
The waste material was identified in and around the site as well as in the institute. The mango planks were identified in the college campus which were collectively painted bright keeping the objective of designing the park to be used by the kids in the near future by the students themselves. These colorful planks were used as a fence tied with the existing wired fence to solve the problem of the fences which were either broken or twisted by the trespassers.

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Tyre seating:
The use of LQC methods involved the use of tyres of various sizes being painted and turned into comfortable seats as resting places for the children.

The gate:
A revolving gate to prevent the stray animals to enter into the park has been designed and installed at the site.

The feedback:
The overall acceptance of the idea and its execution took place with excellent results. Quoting a resident around the site.
"This has changed the way our mornings begin and our children have an interesting area to play with". The transition of a waste space to a useable one has been a great learning process not only for the participants but for the kids and adults in the neighborhood as well.

5.0 Conclusion:

To conclude if we relate change maker project with 4 learning modes of Kolbe's cycle of experiential learning, in concrete experience, students learnt to be sensitive towards the environment and people residing around. In reflective observation students interacted with people and carefully observed the need and the problems related and made a judgment to solve it with a different perspective.

In abstract conceptualizations students logically analyzed the ideas to actually execute it on the site.

The action plan was systematically made by sequentially arranging the task right from making drawing to getting it executed on the site.

In active experimentation students involved themselves in getting the plan executed on the site with the basic understanding of people's need and comfort. These hands on experience also helped them understand the teamwork, material, finance, construction, public relation management.

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