

Transforming Architectural Education Through Exploratory Design Studios: Bridging the Gap Between Academia and Professional Practice in the Context of Nep 2020

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Abstract—

The design studio forms the core of architectural education, serving as a primary platform for integrating creativity, technical knowledge, and critical thinking. Unlike other courses, the architectural design studio adopts a unique problem-solving approach and is widely regarded as the foundation of the curriculum. It plays a vital role in developing students' skills, sensibilities, and design thinking abilities while fostering creativity and innovation.

In the context of evolving educational reforms under the National Education Policy (NEP) 2020, there is a growing need to shift from conventional, instructor-led studio models toward more student-centered and inquiry-driven approaches. This study explores the Exploratory Design Studio Model as an innovative pedagogical method aimed at enhancing learning outcomes and bridging the gap between academic training and professional practice.

The research is based on an experimental studio conducted with third-semester students at Dr. D. Y. Patil College of Architecture, Akurdi, Pune, India, focusing on the design of a primary school. The studio emphasized exploration, user engagement, and iterative design processes. To evaluate its effectiveness, a mixed-method approach was adopted, including questionnaires, structured interviews with students and faculty, and analysis of design outcomes.

The findings highlight that the exploratory approach significantly improves students' critical thinking, creativity, and problem-solving abilities, while also enhancing their understanding of real-world design challenges. The study concludes that integrating exploratory pedagogies within design studios aligns with the objectives of NEP 2020 and contributes to improving the employability and professional readiness of architecture graduates.

Keywords— Exploratory Model, comprehension of the exploratory model, design process, and grading Rubric

INTRODUCTION

Prior to the middle of the 19th century, according to studies on the history of architectural education, there was an apprentice system in place where prospective architects would work under the direction of an experienced architect. In order to reproduce itself, the field of architecture has relied on the transfer of symbolic capital through networks of teachers and students and personal connections.

The "Design Studio" is used as a kiln in traditional architectural training institutions to mould future architects, which is their key distinguishing feature. They believe that current educational practices fall short of preparing pupils for real-world conditions. The standard

educational system for architecture oversimplifies and occasionally neutralizes important variables that are supposed to be considered, according to research on the subject. To have a significant influence on any architectural solution. In conventional systems, concerns like economic factors, social impacts of the design, urban setting, client wants and interferences, and others have all been marginalized and skipped over. The "Individuality" of traditional systems is still another major issue. Despite the fact that in the real world an architect must work in a team, conventional methods train architects as solitary creative persons to improve their senses and design skills to build a better world.

The design studio, considered to be a primary part of the architectural education system, may be seen as a social and intellectual system that includes information and the construction of thinking process through social interactions and places a strong emphasis on creativity. (G.K. Önal, 2017). Negotiations, on the other hand, are about communication, flexibility, mutual respect, and acceptance of limits. Communicating is more than just making sense-filled drawings; it's also about listening to and comprehending the other person. The gap between the world of architecture and society is another major issue. There are two key problems as a result of this profound integration into society. The first was the alignment of architectural preferences with societal demands. The second was how people saw architects' contributions to society and their worth. Open communication of information of all kinds, including knowledge that is based on facts, theories, applications, concepts, and science, serves as the primary teaching method in the design studio. (Chawla, 2017) The fundamental objective of the architectural design studio—the design process and final product—is facilitated by several types of information transfer. (Chawla, 2017)

Issues with the Traditional Design Studio

- Places more emphasis on the outcome than on the means.
- Concept generation and schematic design are the extent of the designer's experience.
- The application of knowledge is not always seamless.
- Information is overly simplified.
- the final presentation and the initial sketch's primary points

LITERATURE REVIEW

The process of designing an architectural structure is regarded as an example of innovative problem-solving, wherein original, thought-provoking concepts first surface. Creativity, a social and cognitive method involving the development of novel thoughts or ideas and innovative linkages between the current ones, is a component of conceptual design. (G.K. Önal, 2017) The ability to generate a large number of unique ideas is what is meant by creativity. (Soliman, 2017) Hence, design issues must concerns. The ability of the project problem to inspire students' creative thinking is another crucial tactic that raises the likelihood of producing innovative products. (Ghonim, 2016). The position of the designer needs to be changed because design is viewed as an applied behavioral science (Hasanin, 2013). But, historically, the education of an architect has been extremely customized, focusing on the development of a personal skill set with little to no interaction outside of that between the student and the instructor. (Thomas McPeck, 2019). According to Meiss, a design studio should consist of a collaboration between an experienced and novice individual who are seeking to grasp knowledge together, rather than two sides where one side knows everything and the other doesn't. (Design in a world of permissiveness and speed, architectural education, 1995). The traditional method of teaching design, a project-type design activity, concentrates on students' comprehension of design theory rather than on design practice. (Iveren). A variety of models, including case problem (experimental)

models, analogies, participatory models (community-based design learning), hidden curricula models, pattern language models, concept-test models, double-layered models, energy-conscious models, exploratory models, and interactional models, have been developed by various design schools. (Salama, *New Trends in Architecture Education*, 1995) (Salama, *Transformative pedagogy in architecture and urbanism*, 2009). The findings from the experiments show that the educational computing curriculum should be enhanced with additional practical courses and topics on new technology.. (Alheadary, 2023) There is an urgent need for more published conversations and research on the historical aspects of design teaching as well as on modern design studio pedagogy, as evidenced by the dearth of significant studies and growing worries about undergraduate pedagogy in universities. (Salama, *Transformative pedagogy in architecture and urbanism*, 2009)

UNDERSTANDING EXPLORATORY MODEL

A. Aim

This studio's goal is to foster students' creativity by encouraging them to use the Exploratory Model of Design in conjunction with a creative exercise to arrive at an original solution.

Being novel is being innovative. But not everything new is always novel. The same thing done in a different way could produce an intriguing outcome. It affects how a teacher approaches an old problem and what kind of role they play in the studio.

Creative thinking is crucial. For fascinating results, creative exercises and strategies are crucial throughout the design process, but especially in the design studio.

B. Objective

1. To determine the instructional design Exploratory Model.
2. To determine the level at which the model can be implemented as action research, and to figure out how it can be incorporated into the studio.
3. To choose which creative exercise is most appropriate for the exploratory model of design in order to use it to improve the student's creativity.
4. To determine the model's stages based on the grade level of the chosen pupils and the stage at which the creative exercise will be most effective.
5. To run the model in the studio while documenting the process and results.
6. To assess the results and reach a decision in the end.

C. Architecture Design Concept in Exploratory Model

In 1983, Julia Robinson and Stephen Weeks created the model.

This concept suggests that design is a sort of programming that involves both verbal and numerical investigation.

This approach considers words and their ability to take on physical form as more potent instruments than the linguistic concepts built into the images.

The words and images can be combined to work analytically, synthetically, logically, and intuitively.

The exploratory model makes an effort to enhance students' comprehension of knowledge pertinent to design challenges while they create solutions.

The Exploratory Model, according to Ashraf Salama, indicates three areas of concern regarding design challenges that the students ran into when tackling them. These three categories are as follows:

- Restricted number of sources due to lack of expertise with methods for examining design-related issues

- Difficulty incorporating difficulties pertaining to functional requirements that go beyond fundamental concepts.
- A rare achievement in that a range of design concerns were successfully included into the solutions, while the design process typically resists the integration of concepts until the project is complete. (Salama, New Trends in Architecture Education, 1995)

D. A DESIGN activity according to the EXPLORATORY MODEL is:

- Using induction, deduction, and connecting theory to specific issues.
- Reasoning and intuition.
- Examining the social systems.
- Process of physical skill improvement.
- Moving between analytical, synthetic, and evaluative thinking modes while engaging designers intellectually and socially.
- Citing analogy as the best source of original thought.
- Finding out about the physical connections that support a recurring human scenario.
- Exploration of language, numbers, and forms.

E. DESIGN PROCESS

Analysis and synthesis are not intentionally separated in this methodology. They are viewed as necessary ongoing processes that are beneficial.

* It is ideal for the design and programming processes to work together simultaneously.

* The process of Design should be recorded and stated clear to ensure design development may be tied to the design result since it is a process of investigation of the issue, alternative Synthesis, and assessment rather than problem solution. To enable understand the adoption of techniques as a required tool for creating ideas, the design process should be straightforward.

* The process stresses knowledge acquisition while developing design alternatives and portrays the programming phase as a significant component in the studio. It is fundamental to the social, political, and cultural fabric.

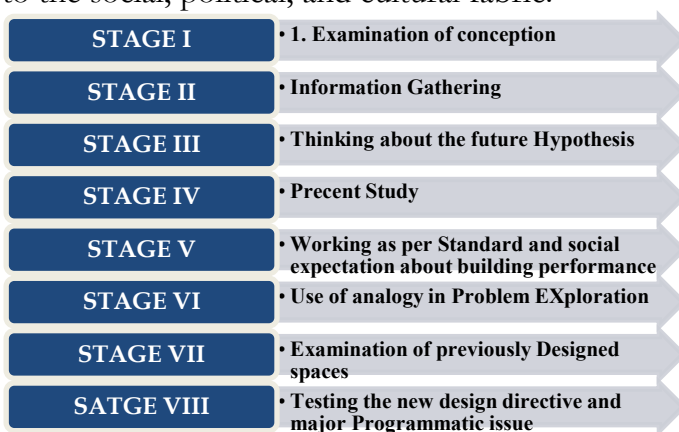


Fig: 1 Design Process
Source: Author

F. IMPLEMENTING STYLE LEARNING IN THE EXPLORATORY MODEL

- It deals with the verbal and visual learning styles of students.
- It enables the learner to participate in both the design process and an exploration of the issue.
- Students carry out independent projects.

- The approach places a strong emphasis on how knowledge should be applied to specific circumstances.
- The approach is built on making the student's motivation a priority in the studio.
- It emphasises both individual and group labour activities.
- The teaching method emphasises the growth of the pupils' analytical skills.
- It is built on showing students how to distinguish between pertinent data in each design phase.
- The basis for style is desk critiques and group reviews.

EXPLORATORY MODEL APPLICATION IN DESIGN STUDIO ALONG WITH CREATIVE EXERCISE

As was already said, the purpose of this studio is to foster students' creativity and encourage them to look for novel solutions by combining the Exploratory Model of Design with a creative activity.

- Architectural design includes the capacity to use both verbal and visual approaches since it is the development of meaning and the transformation of that meaning into physical form.
- A verbal strategy is employed to investigate and produce combinations.
- The main concerns are identified and selected using a visual approach.
- Level: The third semester of the second year is the level of the students chosen for the studio. B. Arch, and their assigned typology is to create a school.

The steps in the actual process of creating an exploration model have been changed to accommodate the studio's allotted time and to make the procedure simpler for lower-level students.

Following are the ways in which each stage of the exploratory model has been modified to fit the needs of the studio and been put into practice.

G. Stage 1: Preconception is examined

The students had previously implemented the School design typology during their first year of B.Arch. Hence, they had certain preconceived notions about how to construct a School. Instead than just meeting the functional requirements for the Bungalow, the aim of the design studio is to challenge student's way of thinking. So, the design studio has been assigned the same design typology as "Design of School" as a time bound Problem that must be completed in 6 hours [360 minutes].

Creative Exercise

A creative exercise called BRAINSTORMING has been undertaken, and this exercise is paired with MIND MAPPING as well, to examine the preconceived beliefs and ideas in the Students brains concerning the "typology-School."

Alex Osborn created the brainstorming exercise for creativity in 1960.

Brainstorming

Using the group creative technique of brainstorming, a group attempts to solve a specific problem by compiling a list of ideas that members offer on the spot.

It is a collaborative activity that encourages spoken expression without any restrictions on criticism or discussion.

The term "Individual Brainstorming" is used in the studio to refer to brainstorming in a solitary setting. This type of Brainstorming frequently uses techniques like free writing, free

speaking, word associations, and the creation of mind maps, which let students visually organize their thoughts.

It is a helpful technique for creative writing and is superior to group brainstorming in terms of idea production.



Fig: 1: Student Work on Brainstorming Activity
Source: Students Studio Work

H. Stage 2: INPUT given to the students on CLUSTER PLANNING

After exploring the preconceived thoughts and ideas about the school through the Brainstorming exercise, an input is given to the students on cluster planning.

Since the design process typically prohibits the synthesis of ideas until the end of the project, it is uncommon for students to incorporate a variety of design concerns in their solutions in the traditional design studio.

Hence Cluster planning and Day lighting, these two issues are incorporated in the designing

I. Stage 3: Use of Cluster Planning in the Design

After the input on Cluster Planning, the students had been asked to prepare a plan on school on the basis of cluster planning. In stage 1. Of the studio, while doing the brainstorming activity the student already listed the different spaces in the school. The students had been asked to make different arrangements of spaces in the school in the form of cluster. They were also told to make use of different transitional spaces, like courtyard, passages, corridors, steps etc. The time assigned to the students is 45 min.

J. Stage 4: INPUT/INSTRUCTIONS on DAY LIGHTING and its Implication

Day lighting is an important issue related to sustainability.

If the building is so arranged, or the built form is evolved in such a way that maximum use of day light can be done in the built structure, it will be economically beneficiary as well as saving of lots of non-renewable energy.

The various categories of Day lighting, the factors affecting it, the implications of day lighting on the built form and how it can be efficiently used in the built structure has been explained to the students

Simultaneously various instructions were also given regarding the directions, the shapes of built form. The instructions were given verbally as well as with the help of schematic sketches

K. Stage5: Implementation of Day Lighting in the Cluster Plan of the School Made by the Students – INSTRUCTION & DOUBT

This stage is of giving instructions about the necessary changes the students had to make in their cluster plan of the school The next major part is of doubt clearing The students gets little bit confused in incorporating the cluster plan, day lighting and spaces required in the school. All the necessary guidelines were given to the students about how they can use the walls, roof, openings, pergolas etc., as a means of efficient source of Glare free Day lighting in the built form of school.

Most of the Students made use of light from the north direction as far as possible in an effective way.

This stage becomes a very crucial stage since it act as a backbone of exploring the thought process of students from the functional fulfillments to using the ideas and thoughts in exploring the other aspects of designing

L. Stage 6: Making the Schematic Plans / Sections / Details / Models explaining the concept of use of Day lighting in the Cluster Plan of School

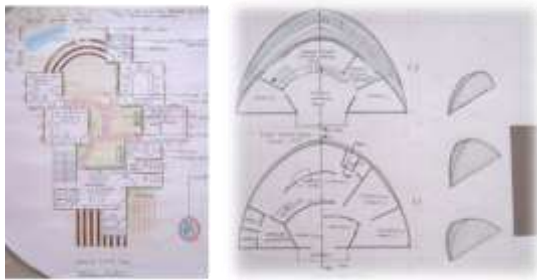


Fig: 2: Schematic Plans
Source: Students Studio Work



Fig: 3. Model Explaining the Concept of use of Daylighting in the cluster plan of School
Source: Student Studio Work



Fig:4: Section/Details
Source: Students Studio Work

4. EVALUATION CRITERIA

The reason for conducting the studio is to explore the thoughts process and ideas from the minds of students and recording them through their output.

Hence the complete process was important in this studio. Evaluation of the work obtained from the students is done on the basis of their performance in each stage.

Maximum percentage is allotted to those designs which has fulfilled the basic objectives which are

1.	Individual units of school clustered together with naturally lit interactive spaces gives a feeling of openness
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2.	Appropriate use of Daylight in School building enhances the efficiency amongst the students
3.	Effective design as per Day lighting and cluster planning will help in creating a better environment for students in School
4.	Cluster planning helps in making the school environment lively
5.	Interactive and productive open spaces are possible with the use of cluster planning in School design

Fig: 6 : Evaluation Criteria
Source: Author

5. RESULTS AND FINDINGS

At the final jury, questions and conversations with students, faculty, and jury members were used to gather input about the design process and assess how well the Exploratory Model over the standard process design process. Finding the problems and factors that have a big impact on the built environment that needs to be developed is the first stage in any design process. These problems later become the project's aims and objectives. The viability of the derived goals determines the creation of solid and suitable concept that serves as the cornerstone of a successful design. A successful design output depends on the ability to confidently and intelligently make informed design decisions throughout the design process. Therefore, the students were inquired to compare the Exploratory design process to the traditional design process based on a variety of criteria, including their capacity to recognize design parameters and problems their understanding of the project's requirements and objectives, their ability to come up with relevant ideas, their level of assurance in their design decisions, the success of their conceptual design, in addition to the overall outcomes and issues they ran into,. The feedback's outcomes are listed below. Based on their understanding of traditional design and the Exploratory design process, efficacy in identifying design criteria and issues during the pre-design phase, and knowledge of traditional design, the jury, teachers, and students evaluated the submissions. The jury, teachers, and students all agreed that the interactive approach resulted in more explicit and articulate design judgements than the traditional design process did. Design evaluations are crucial in helping students improve their designs. User groups' participation in the evaluation process resulted in real feedback on the design. Many opinions on the design were provided by the evaluations from architecture instructors, building users including schoolchildren and educators, and professional architects.

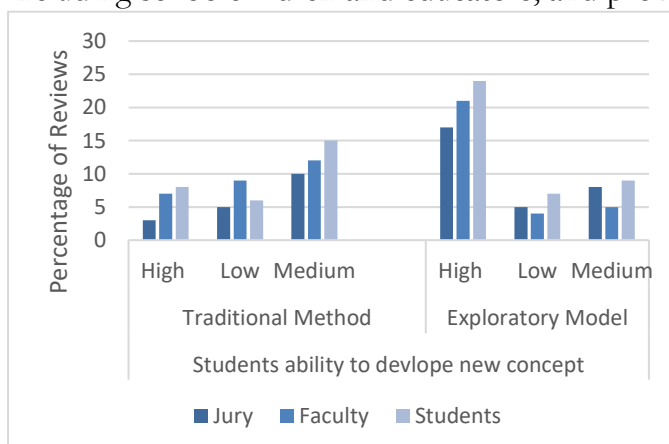


Fig: 1 Student Ability to develop new Concept
Source: Author

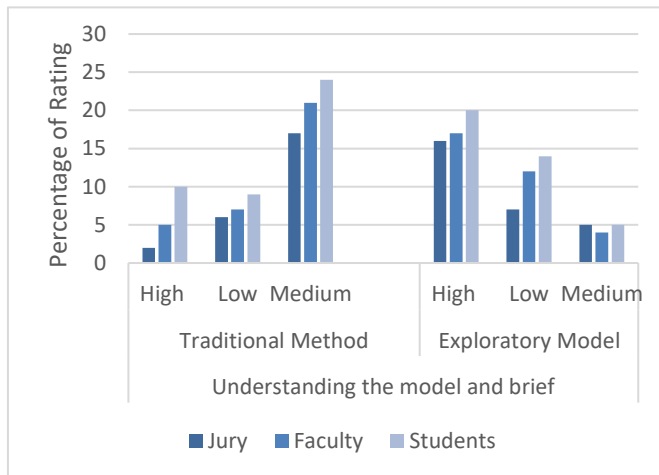


Fig: 2 Understanding the Model and Brief
Source: Author

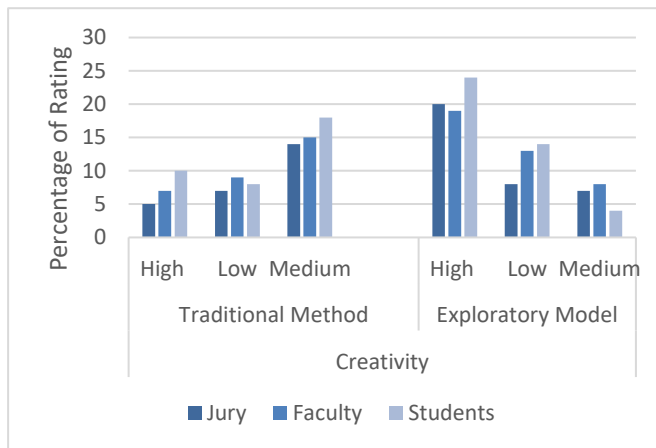


Fig: 3 Creativity
Source: Author

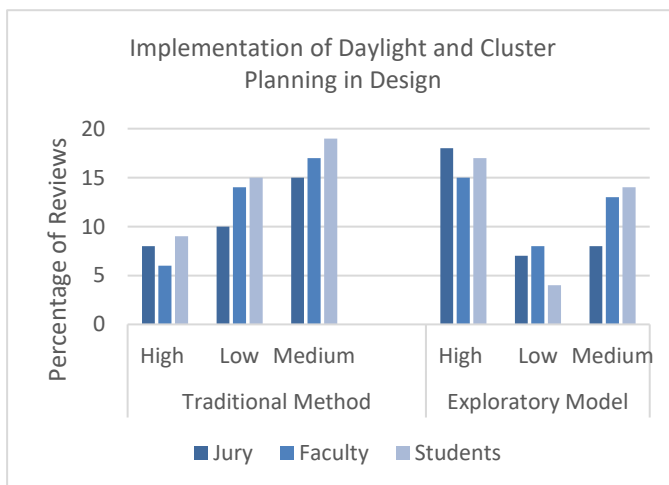


Fig: 4 Implementation of Daylight and Cluster Planning in Design
Source: Author

6. CONCLUSION

In the exploratory model, there is an exploration of verbal and visual ideas from the student's mind which is documented throughout the process of the Studio – III. The

complete exploratory model has not been carried out in this Studio due to the limitation of time. The stages of Exploratory model which are covered in the Studio –III are: Examination of preconception through Brainstorming (Creative Exercise) Information Gathering Thinking about the future through hypothesis – Here the hypothesis which has been proved is “Effective design as per Day lighting and cluster planning will help in creating a better environment for students in School” which was instructed as an objective to the students. Precedent Study and Working as per standards & social expectations about building performance. This age has been taken through the study of Cluster Planning and Day lighting In the regular curriculum, the typology of School was conducted as per the functional requirement. But if in addition to the fulfillment of the functional requirements, some more issues like Cluster Planning, Day lighting (which are considered in this studio) are taken in the exercise the designs of the students will come out in a better way. The innovative ideas can be explored through this kind of exercise. The Exploratory Model can be used to support any academic perspective because it highlights the significance of the method rather than the outcome.

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