IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Formative Ideas And Student Explorations: A Pedagogical Study Through *Precedents In Architecture*

Ar. Melona JX Beatrice, Dr. Renganathan R

Assistant Professor, Principal

Department of Architecture

Sigma College of Architecture, Kanyakumari, India

Abstract: Precedent studies are indispensable in architectural education. The structured exposure to spatial structures, types of reasoning, and diagram interpretation is what the students get from them. In this paper, a teaching experiment with second-year architecture students has been reported, where Clark and Pause's Precedents in Architecture (2012) book provided the framework. The workshop dealt with four conceptualizations: centralized, radial, linear, and clustered/grid. It brought about systematic studies of precedents, merging forms, and making eleven-part diagrams. Qualitative methods were applied to evaluate the learning of students. These methods were observations, self-reports using the Subject-Copula-Predicate format, and the thematic analysis of visual outputs. Furthermore, a questionnaire was given to 28 participants. The results indicate that working with types and mixed spatial interpretations enhanced students' analytical clarity, expressing power, and creative confidence. The research suggests making reasoning through diagrams, using typological language, and reflecting on language as the main teaching tools for improving design understanding in early architectural education.

Index Terms -Formative Ideas, Precedents in Architecture, Parti Diagrams, Typological Analysis, Pedagogy, Knowledge Graph.

I. INTRODUCTION

Architectural education is based on the constant movement between analytical reasoning and creative synthesis, with precedent study acting as a mediator for a long time. By interacting with exemplary works, students get to recognize the logic of organization, spatial hierarchy, and the design intentions that are rooted. However, precedent study more often than not falls into the trap of being passive unless it is coupled with methods that persuade students to reimagine and mix up the architectural concepts. This research aims to fill that void by employing the typological vocabulary introduced in Precedents in Architecture by Clark and Pause, a book selected for its capacity to effectively condense difficult spatial systems into diagrammatic and conceptual cores. Its division of architectural form into four major typologies—centralized, radial, linear, and clustered/grid offers a supportive structure that is easy to use for the students at the beginning of the design process.

The workshop, following the research question, How can formative ideas in architecture be understood, combined, and reinterpreted through precedent study to enhance analytical and creative thinking?, integrated two tools that complemented each other: a categorized knowledge graph and SCP reflective statements. The knowledge graph illustrated the connections between the 28 precedents studied, their typological traits, and the hybrids formed by students, thus showing how architectural ideas flow from one organization to another. Through the SCP reflections, visual reasoning became linguistically clear, as students were required to express each insight through a structured subject (architectural idea), copula (relationship), and predicate (spatial or experiential implication). These methods, together, built a unified teaching framework that allowed for both the analytical depth and the playful creativity, therefore putting formative ideas as elastic parts in design thinking.

II. METHODOLOGY

This research utilizes a combination of methods, a studio-based research design that mixes all the three approaches such as the analytical, the visual, and the reflective to study how students comprehend and change the ideas of architecture that were given to them in the form of the future. The workshop involved twenty-eight second-year students and it started with structured precedent analysis under Clark and Pause's four categories of typology—centralized, radial, linear, and clustered/grid. Each of the 28 chosen precedents required students to document the spatial logic, circulation patterns, geometric ordering, and boundary constructs, which formed the main analytical dataset. The resulting insights were further expressed in eleven ways to diagrammatic reasoning, such as parti diagrams, mass–void structures, circulation overlays, and geometric abstractions.
Later, the students developed mixed types by merging the given two precedents, and they experimented with different geometries, zoning, hierarchy, and movement paths. Instructors used SCP reflective statements to articulate the conceptual interpretations of the students who got their analytical and creative reasoning recorded in a language form. The observations made by the instructor during the workshop revealed the students' decision-making patterns and the difficulties they encountered, whereas a post-workshop survey measured the perceived learning gains in relation to typologies, diagramming, and hybrid formation.
Data collected, such as diagrams, hybrid forms, reflective statements, surveys, and field notes, underwent thematic coding and visual-relational mapping as analytical methods. The outcome of these analyses was a knowledge graph that brought together the different aspects of the research: typologies, diagrammatic operations, hybrid strategies, and learning patterns observed. The triangulation of different qualitative sources contributed to the trustworthiness and richness of the results.

2.1 Workshop Design

Twenty-eight students were divided into four groups, each addressing one formative type.
Each group undertook the following tasks:

- Analyze plans, sections, and organizational logics of selected precedents.
- Identify formative operations such as addition, subtraction, repetition, and hierarchy.
- Generate hybrid forms by merging the spatial principles of both precedents.
- Produce eleven parti diagrams per hybrid form, exploring organizational logic through diagrammatic lenses (axis, symmetry, circulation, mass–void, etc.).

The workshop extended over one week and culminated in student presentations, knowledge graph compilation, and reflection surveys.

III. WORKSHOP OUTCOMES

3.1 Hybrid Form Explorations

Hybrids turned into instruments of operational thinking among all the groups—allowing pupils to formulate spatial hypotheses, creatively play with geometric manipulations, and carry typological logic into fresh artistic avenues. The outcomes were illustrated with models, plans, and repetitive diagrams (refer to Figure 1).

Table 1
Hybrid Formations and Pedagogical Focus

Form ID	Precedents	Key Spatial Characteristics	Design Focus
A. Centralized	Villa Savoye + Farnsworth House	Geometric clarity, axial symmetry, open planning	Balance between openness and centered composition
B. Radial	Villa Rotonda + Capitol Complex	Central cores, radiating axes, monumental geometry	Fusion of classical symmetry with modern monumentality
C. Linear	Guggenheim Museum + Barcelona Pavilion	Sequential spatial movement, horizontal continuity	Sequential continuity and rhythmic spatial flow

D. Clustered/Grid	Salt Institute + Säynätsalo Town Hall	Modular repetition, informal clustering, civic intimacy	Negotiation between order and informality for community use

These hybrids allowed students to test spatial hypotheses through scaled models and diagrams, transforming typological understanding into creative reinterpretation.

Centralized ***Radial*** ***Linear*** ***Clustered/ Grid***

Figure 1.Hybrid Models done by Students based on the given precedents

3.2 Parti Diagram Analysis

In order to intensify their analytical engagement, each hybrid was put under the eleven parti diagram lenses scrutiny. This activity allowed the students to isolate core spatial operations and express them in a diagrammatic way. Among the lenses were:

- Axis
- Symmetry
- Circulation
- Hierarchy
- Addition/Subtraction
- Repetition
- Solid–Void Relationship
- Spatial Progression
- Transformation
- Plan–Section Relationship
- Mass–Void Articulation

This recursive drawing method made students rely less on their instinct derived from the visual qualities of the forms and it also helped them develop precision in their architectural reasoning. By illustrating every hybrid with the help of a number of conceptual frames, the students got the impression of the design intent shifting when they altered the geometry, sequencing, or volumetric emphasis. The Parti diagrams also played a pivotal role in linking visual observation and conceptual synthesis, thus, becoming one of the most important analytical layers in the workshop outcomes (see Figures 2,3,4 and 5).

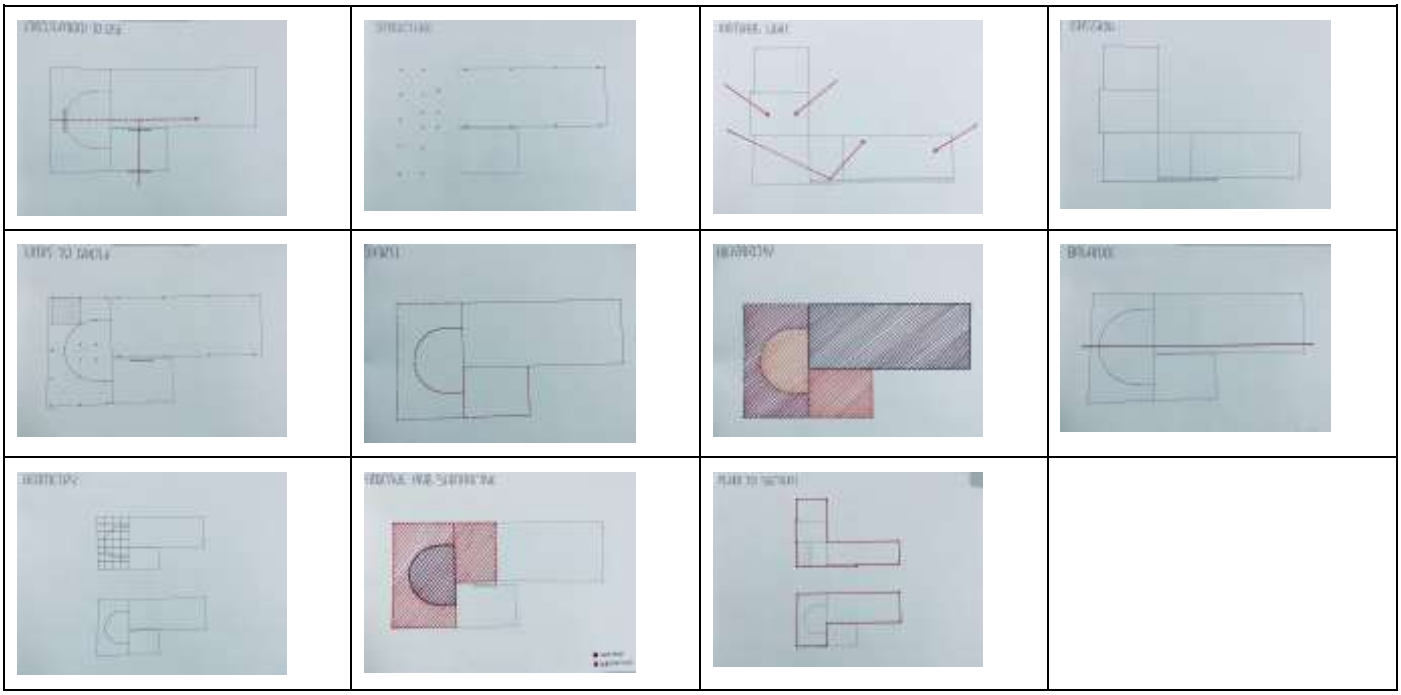


*Figure 2. Student Parti Diagram - **Centralised** (Villa Savoye + Farnsworth House)*

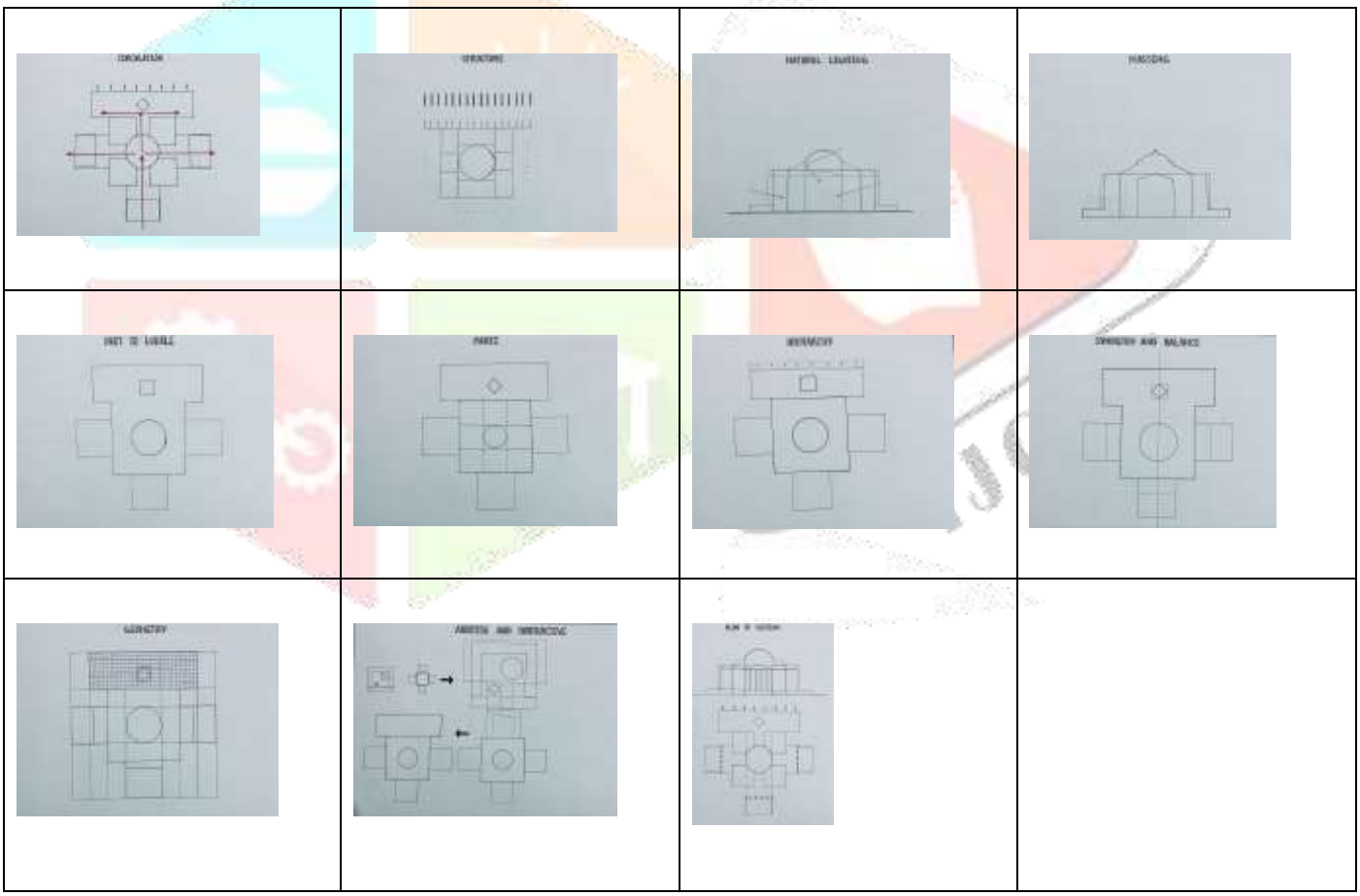
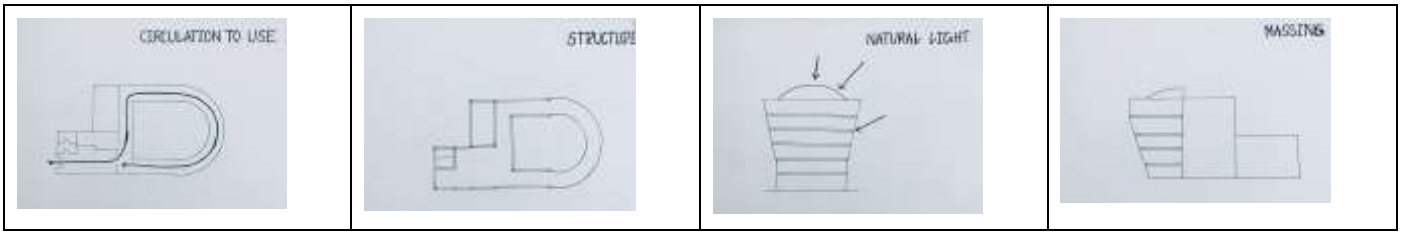


*Figure 3. Student Parti Diagram - **Radial** (Villa Rotonda + Capitol Complex)*



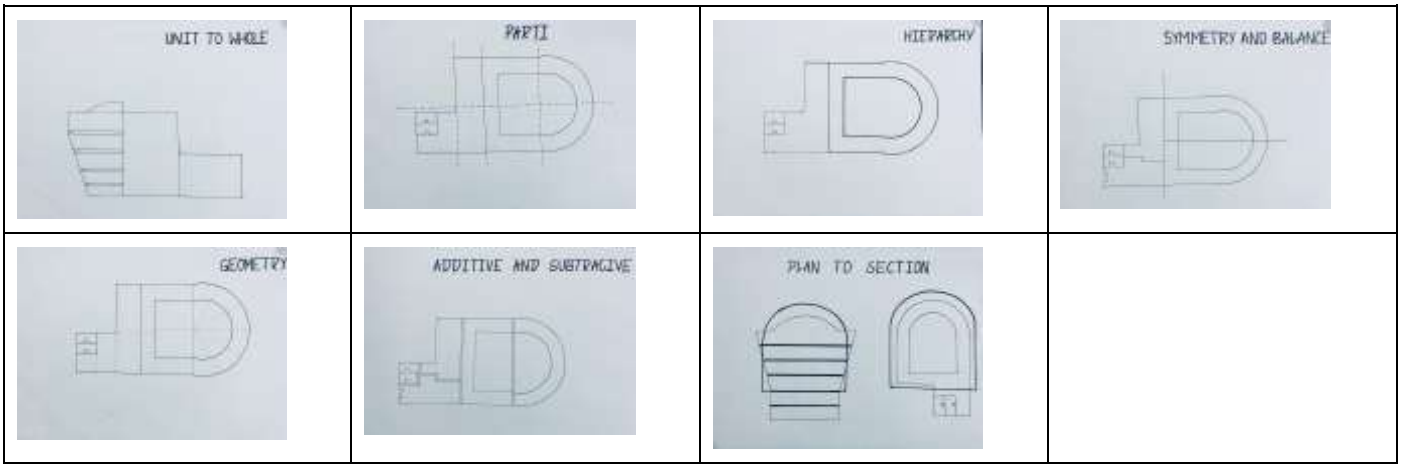


*Figure 4. Student Parti Diagram - **Linear** (Guggenheim Museum + Barcelona Pavilion)*

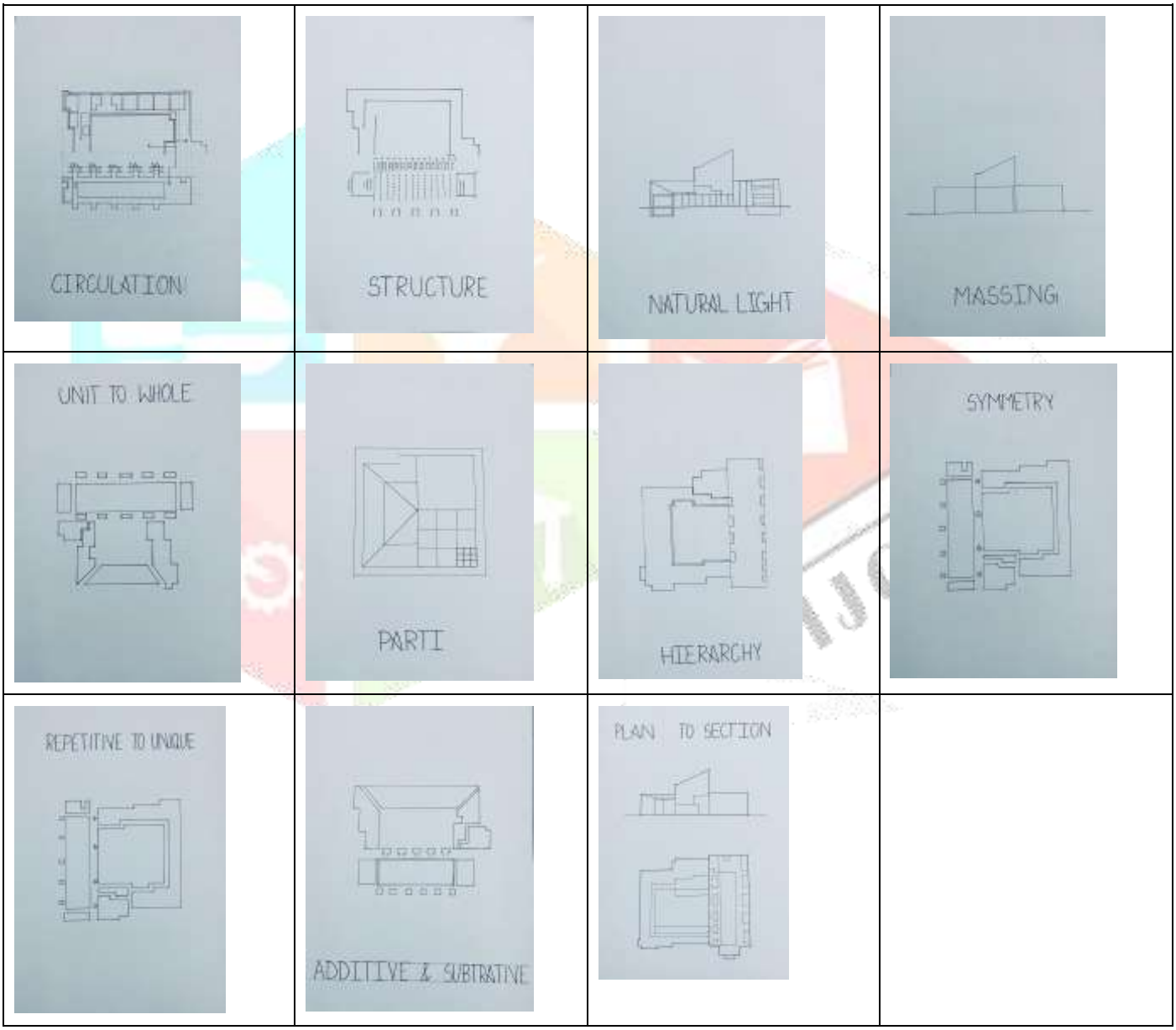


*Figure 5. Student Parti Diagram - **Clustered/Grid** (Salt Institute + Säynätsalo Town Hall*

IV. Knowledge Graph As A Pedagogical Framework

The Knowledge Graph provided a temporal as well as logical illustration of the complete learning process. It pointed out the way very clearly from unprocessed precedent observations to design insights. The initial step was to identify the four basic spatial categories: Centralized, Radial, Linear, and Clustered/Grid. They acted as the conceptual bearings for the rest of the analysis. After that, the precedent pairs were categorized according to their typology, with each pair being precisely

characterized in terms of spatial logic, movement patterns, geometric order, and boundary conditions. Coding was a kind of metamorphosis where the student's implicit emotions turned into organized analytical data.

The insights that were extracted influenced the creation of hybrid forms in which the students tried out the transfer, mixing, or reinterpretation of the spatial qualities. During this phase, the conflicting logics, the emergent geometries, and the typological innovations became apparent as the students were delving into the organizational systems. Each hybrid was analyzed from eleven parti diagram perspectives—among them, axis, hierarchy, symmetry, mass–void, circulation, and spatial progression—that allowed students to pinpoint individual actions and to realize how architectural meaning changes when it is presented in a different way through diagrams.

Through these monotonous visual analyses that were revealing the fundamental spatial principles and the design strategies that could be transferrable, students were able to extract the learnings from the abstract design. Knowledge Graph, when combined together, proved that the typological classification, analytical decomposition, and diagrammatic synthesis had, in concert, created a pedagogical structure that was coherent; it made the learning journey clear, traceable, and intellectually rigorous.

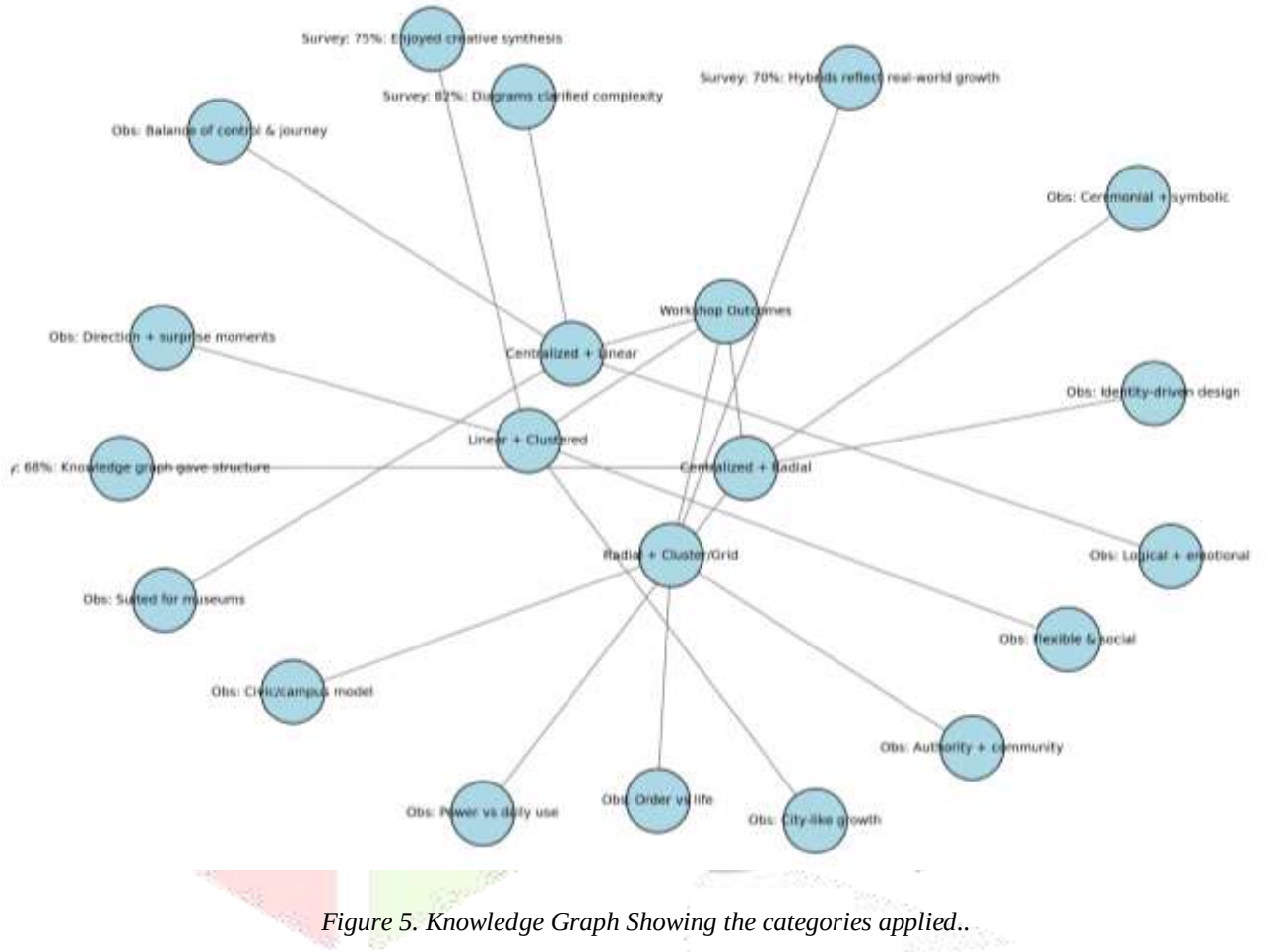


Figure 5. Knowledge Graph Showing the categories applied..

In the end, the Knowledge Graph disclosed a spiral of learning **Knowledge → Application → Reflection → Design Strategy** showing students a diagram that helped them follow their conceptual development and realize the part played by analytical reasoning in the growth of creative design.

V. Student Reflections And Survey Results

5.1 Analytical Skills

From the survey results, it was concluded that 82% of the students preferred to learn about the principles of spatial logic by means of the parti diagram exercise instead of through traditional lectures. Among others, the students felt that the systematic framework provided by the different diagrammatic lenses on the same hybrid form made dividing and analyzing the architectural order as well as making the hidden organizational patterns visible much easier.

5.2 Creativity and Synthesis

The majority , 75% of the students, voted for using the precedents in conjunction with one another as a means of developing new concepts rather than merely copying. Many students stated that the technique of hybridization allowed them to "break and build" spatial systems while preserving the conceptual consistency thus demonstrating that the formative ideas can in fact be an inspiration rather than a limitation to the creative process.

5.3 Structured Learning through Visualization

Approximately 68% of the students claimed that the Knowledge Graph has transformed the process of their learning into a smooth one and thus has made the very clear connections between typological analysis, hybrid formation, and design reasoning visible. There was a significant boost in students' perception of the theoretical content being translated into the actual design results because of the mapping of the operations they underwent.

Selected Student Reflections:

- "The diagrams enabled me to grasp the idea that a building can be seen from different angles."
- "Blurring boundaries between categories was like a creative process, not like copy."
- "The knowledge graph was the link between theory and design for us."

VI. Translating Reflections Into Design Strategy

In reflective discussions, students gave their observations in short phrases, which were constructed in accordance with the **Subject–Copula–Predicate (S–C–P)** format (for instance, "The linear axis organizes movement through a central core."). The use of this verbalization pattern was purposeful as a teaching strategy to convert personal reflections into universal and clear design principles. By assigning to each insight an essence (subject), a relational action (copula), and an implied spatial effect (predicate), students could express and qualitatively analyze intricate spatial thinking through a structured and analytically precise way.

Table 3

Subject–Copula–Predicate Framework as a Design Translation Tool

Hybrid Type	Subject (Essence)	Copula (Relation)	Predicate (Design Strategy)	Design Caution
Centralized + Linear	Linear axis	Organizes	movement through a centralized core, creating rhythm	Avoid monotony—vary spatial and light quality
Radial + Clustered	Radial geometry	Defines	a strong center with flexible peripheries	Avoid over-symmetry in cluster growth
Linear + Clustered	Linear spine	Connects	social nodes within clusters	Avoid abrupt transitions disrupting flow
Centralized + Radial	Form combination	Evokes	ceremonial spatial order suited for institutions	Avoid rigid circulation hierarchies

The S–C–P model, therefore, turned out to be not only a linguistic exercise, but also a bridge for analysis connecting verbal reasoning, diagrammatic interpretation, and spatial design. Its joining helped that reflective thinking was not an abstract matter but was converted into systematically strategic, design-oriented principles translating that students could take on in their future studio work.

VII. DISCUSSION

7. Discussion

The combination of precedent analysis, diagrammatic reasoning, and linguistic reflection not only increased the complexity of the whole learning process but also changed students from being passive observers to active interpreters. The Students, by means of hybridization, treated the precedents as the wellspring of their creativity instead of the ones to be copied; therefore, they were able to explore spatial possibilities and alter the notions. The main sequence of techniques, **Observe→Diagram→Hybridize→Reflect→Strategize**, illustrated how the germinated ideas could be turned into cognitive tools for architectural education.

There were three main learning outcomes. Diagrammatic lenses made it possible for students to analyze spatial hierarchies, circulation systems, and formal logics simultaneously and with great precision; thus, **analytical thinking** was fortified. The variation of art forms encouraged **creative thinking** as well as rethinking stereotypical copying by fostering a new style based on a deep understanding of different types. The S–C–P linguistic system was the basis for transforming spontaneous feelings into well-articulated design strategies training; therefore, **reflective thinking** was reinforced.

The qualitative observations were backed by quantitative data: 82% of the students mentioned that they have got better clarity of thinking when they have used **diagramming,** 75% of them expressed that they were empowered and increased their creative confidence due to **hybridization,** and 68% claimed that the **Knowledge Graph** rendered their learning path more coherent and interrelated. By these results, it is clear that the combination of articulating verbally, mapping visually, and reasoning diagrammatically, not only enhances the understanding of the concept but also makes the whole learning process expressively and intellectually structured. In short, the combined findings draw attention to the fact that the pedagogical practice of considering the formative architectural ideas as interconnected systems that can be analyzed, recombined, and translated into strategic design knowledge insights has great value.

VIII. CONCLUSION

The workshop displayed the fact that through teaching the basic concepts with a blend of typological categorization, diagrammatic exploration, and linguistic articulation the concepts are in an enriching way that is highly recommended for students in design thinking. The study of precedents was turned around from a mere passive approach to an interaction process of new meanings generation, thus it made it possible for the students to uncover, validate and even change the architects' reasoning instead of just reproducing the established forms. The use of the Knowledge Graph for the mapping of the connections between concepts and the S–C–P framework for turning reflections into design strategies combined creativity and depth of analysis in a very effective way within the teaching process. The results confirm the idea that the formative vocabulary is not only a theoretical foundation but also a practical teaching tool that can produce critical thinking, responsibly innovating, and clearly and purposefully expressing designers. This holistic approach is a strong model for design education, illustrating how systematic analysis can go along with imaginative exploration in the production of thoughtful and skilled architects.

REFERENCES

[1] Clark, R. H., & Pause, M. (2012). *Precedents in Architecture: Analytic Diagrams, Formative Ideas, and Partis* (4th ed.). John Wiley & Sons.
[2] Salama, A. M. (2015). *Spatial Design Education: New Directions for Pedagogy in Architecture and Beyond*. Ashgate.
[3] Schon, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action.* Basic Books.
[4] Oxman, R. (1999). Educating the designerly thinker. *Design Studies, 20*(2), 105–122.
[5] Goldschmidt, G. (2014). *Linkography: Unfolding the Design Process.* MIT Press.