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CULTIVATING CREATIVITY IN ARCHITECTURE EDUCATION: STUDENT PERCEPTIONS AND PEDAGOGICAL APPROACHES IN DESIGN STUDIOS OF LAHORE

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ABSTRACT

This research investigation examines the pivotal importance of creativity defined in this study as ability to produce original but practical and relevant solutions, whether innovative or not (Weisberg, 2006; Amabile & Khaire, 2008) in architectural pedagogy, with a particular emphasis on student perceptions in the design studio environment. Architectural education must balance the creative process with regard to technology and theory, with the design studio remaining the central place for these fields to converge, enabling students to develop distinguishing and efficient design solutions. There is no compromise with creativity in this equilibrium but it is a concordance, where technology is used to assist the creative process and not restrict it (Gelernter, 1988). To encourage creativity in the studio environment, various teaching strategies are used, such as reflective practices and strategies that promote creative thinking. In addition, models of learning such as Kolb's experiential learning cycle and Leary's interpersonal theory are explored for their influence on student behavior and impact on the learning process in architectural education.

The Pedagogy Survey in the Design Studio identifies significant student experiences and perceptions, providing evidence of a complex educational environment. Although students believe in the importance of creativity, structure, and real-world projects, there are areas for development in relation to pedagogy. Many students express a need for more structured and clearer frameworks to help them formulate their ideas, as well as a more balanced approach to integrating creativity and practicality. Rather than juxtaposing creativity with practicality as opposing forces, this view actually posits their interdependency: practical constraints function as conditions activating creative solutions (Kowaltowski et al., 2012). Additionally, open-ended qualitative feedback reveals students seek a combination of pedagogical support that emphasizes individualized instruction and real-life applications for tangible learning outcomes.

Keywords: Design Studio Pedagogy, Architecture Education, Creativity, Lahore.

INTRODUCTION

Architectural education exists at the intersection of creativity, technology, and theory, providing a space where new ideas are revered. Students are thus required to develop both an artistic point of view and technical skills in the dynamic, multidimensional environment of the design studio. This research investigated the role of creativity in the architectural education of students, looking at their perceptions and pedagogical approaches to find out how it gets inculcated within the design studios of Lahore, Pakistan. Creativity is often acknowledged as a cornerstone of architectural education and beyond. It incorporates not only the production of original and sensible solutions in design but also the capacity for problem solving, flexibility, and innovation across disciplines (Weisberg, 2006; Amabile & Khaire, 2008). For example, creativity plays a crucial role in mathematics, where it drives breakthroughs in solving

complex problems (Hadamard, 1945), and in politics, where innovative strategies can lead to impactful policymaking (Gibson, 2003). This universality underscores creativity's role in both envisioning the future and addressing present challenges. Creativity not only shapes the future but also provides actionable frameworks to tackle contemporary issues (Jeanes, 2006).

The architecture school design studio fulfills all the functions in an education system, at which theoretical classroom knowledge and practical experience are combined under a model of synchronous and asynchronous blended learning (Garrison & Vaughan, 2008). A wide variety of teaching approaches have been developed to promote creative thinking and enhance students' design work. For instance, Goldschmidt and Tatsa (2005) and Casakin and Kreitler (2008) explored how studio arrangements and teaching methods impact creativity. Asefi and Imani (2011) advocate for structured educational experiences, defined as organized activities that foster both divergent and convergent thinking, which enhance creativity throughout the design process. Kowaltowski et al. (2012) support this by highlighting the benefits of structured creativity models, which lead to improved student outcomes through active engagement.

Fostering creativity in studio culture requires introducing reflective practices and encouraging creative thinking strategies. Alterio and McDrury (2003) identify reflection as a key component of meaningful learning, while Hargrove and Nietfeld (2015) highlight the role of associative thinking in addressing diverse challenges. Bhattacharya et al. (2014) further argue that exposure to unconventional scenarios enhances students' capacity for divergent thinking, promoting originality in design solutions.

Integrating theory and practice is vital in architectural education. Gelernter (1988) asserts that this integration directly enhances project quality, a view supported by Turkan et al. (2010), who note that Bilkent University students see value in connecting technical courses with design projects. However, a gap remains in applying historical and theoretical knowledge. Fahmi et al. (2012) suggest that engaging multimedia and physical models enhances the integration of theory and practice by providing students with interactive tools to explore abstract concepts in tangible ways.

By examining learning models like Kolb's experiential learning cycle and Leary's interpersonal theory, this study provides insights into architectural pedagogy. Kolb's cycle emphasizes active experimentation and concrete experience, aligning with the hands-on preferences of architecture students (Powell, 2007). Leary's theory complements this by describing how interpersonal behaviors influence design development processes (Leary, 1957). The theory runs the risk of fitting in the instructional focus on collaborative activities which would aid students in collaborative task commitments performing way better in projects. Such involvement links Powell's emphasis on active learning to Leary's relationships of active experience versus passive experience.

Literature for this study was then filtered through relevance to architectural education, creativity, and frameworks of pedagogy. Selection criteria included credibility, recency, and applicability to the Lahore context, thus ensuring an exhaustive canopy for this research. This systematic approach also highlights a certain linking between the review and the objectives of the research identifying effective pedagogy and areas for improvement with regard to creativity.

This study aims to evaluate how creativity is developed and assessed within architectural education, focusing on faculty instruction, the interconnectedness of knowledge, and learning models. By examining the perspectives of architecture students in Lahore, this research identifies opportunities to refine design studio pedagogy, enhancing student learning and creative outcomes.

REVIEW OF LITERATURE

The Role of Creativity in Architectural Education

Authors like Weisberg (2006) have described creativity as the ability to generate a good number of original ideas. However, creativity today is understood as a multifaceted concept encompassing originality, practicality, adaptability, and the ability to apply insights across diverse fields (CIDA, 2022). It is critical not only in learning and knowledge construction (Kahvecioglu, 2007) but also in solving complex, real-world problems that extend beyond architecture, including fields like mathematics, politics, and healthcare (Hadamard, 1945; Gibson, 2003). Architectural education sits at the intersection of art, science, and technology, requiring a full understanding of creative processes alongside analytical ones.

Creativity remains the most critical component within architectural design because it enables students to navigate this intersection effectively. Amabile and Khaire (2008) argue that creativity is central not only to design but also to problem-solving in other disciplines, further emphasizing its universal relevance. Furthermore, creativity informs both the present and future, serving as a tool for immediate problem-solving and a mechanism to envision sustainable, innovative practices (Jeanes, 2006).

Instructional Approaches in the Design Studio

Design Studio Configuration

The configuration of the design studio significantly impacts the creativity and learning outcomes of students. Goldschmidt and Tatsa's analysis of student ideas during the design process underscores the importance of structuring ideas both qualitatively and quantitatively, offering deep insights into the creative process (Goldschmidt & Tatsa, 2005). Similarly, Casakin and Kreitler's comparison of student and teacher perspectives on creativity reveals the need for design studio interventions that align student operational focus with teacher emphasis on innovation (Casakin & Kreitler, 2008). This approach could bridge the gap between student and instructor perceptions, fostering a more comprehensive understanding of creativity in design.

Asefi and Imani (2011) advocate for a strategic educational model that accommodates different types of thinking at various stages of the design process. By assigning specific tools and methods, they promote a more active engagement in the design studio, enhancing student creativity through structured interventions. Kowaltowski et al. (2012) further support this by suggesting that a more structured approach to creativity in design studios, informed by instructor interviews, can lead to more effective outcomes.

Cultivating Creativity

Incorporating creativity in architecture pedagogy means having reflective practice or thinking strategies built into the design studio. Alterio and McDrury (2003) point out the role of reflection on experience in promoting creativity, especially by using reflective practice as a way to have a meaningful learning experience when participating in a design development project. Hargrove and Nietheld (2015) evaluated the effectiveness of proposing creativity education through associative thinking strategies, which the authors argued provided a higher level of advanced cognitive development experience in creatively solving problems.

Bhattacharya et al. (2014), however, proposed that exposing students to unconventional experiences and virtual experiences resulted in more divergent thinking, while using that experience to encourage students to create new original responses to unusual and unexpected design problems would develop students' overall creative capacity.

Integrating Theoretical and Practical Knowledge in Design Studios

The incorporation of theoretical knowledge alongside practical applications in the design studio is paramount in developing a holistic practice-based architectural education. Gelernter (1988) claims that the effectiveness of architectural practice is directly related to this merging of theoretical and technical knowledge. Bilkent University students, for example, valued the identification of links between technical courses and design projects, especially in construction, lighting design, and building services disciplines (Turkan et al., 2010). However, knowledge from history and theory courses remains less integrated and valued, according to student surveys and questionnaires, contradicting the rhetoric of the course descriptions in that study.

Fahmi et al. (2012) suggest that foundational courses may become less time-consuming and more engaging through the arrangement of lessons as more organized activities with the incorporation of multimedia, physical models, and software. This has dual advantages of a more fulfilling educational experience and, as importantly—as it is this knowledge that relates theory to practice in the design studio.

Learning Models in Architectural Education

Kolb's learning cycle is highly applicable to architectural education, as students often prefer 'active experimentation' and 'concrete experience' when learning (Kolb & Kolb, 2017). According to Powell (2007), architectural students, characterized as 'Accommodators,' thrive on hands-on experience and direct engagement with their practice.

Leary's (1957) interpersonal theory of personality provides additional insights into students' behaviors within the design studio. This theory identifies stable interpersonal behaviors that influence students' responses to design tasks. For instance, a student with a 'friendly/dominant' personality may confidently engage with tasks, while a 'critical/dominant' personality might approach tasks analytically yet hesitantly.

The interplay between Kolb's experiential learning and Leary's personality calls for the tremendously flexible instruction prescribed for students with different learning styles.

ANALYSIS

This section analyze the profile of the study group single young adults and their living arrangements in a shared premise out of family.

Key Interview Questions Emerging from the Models:

How does reflective practice impact your design decisions?

In what ways do you balance hands-on experimentation with analytical thinking?

Table-1: Linking Learning Models and Behavioral Patterns

Learning Model	Key Traits	Behavioral Patterns in Students	Pedagogical Implications
Kolb's Learning Cycle	Hands-on, Experiential Learning	Active engagement, preference for experimentation	Design activities that involve tactile exploration
Leary's Personality Theory	Interpersonal Behavior Dynamics	Confidence in friendly/dominant students; hesitation in critical/dominant students	Adapt tasks to support analytical and confident learners

How do your interpersonal tendencies influence your approach to collaborative design tasks?

MATERIAL AND METHODS

Survey Design and Distribution:

This study was conducted among students enrolled in Bachelor of Architecture (B.Arch) programs at various universities in Lahore, Pakistan. To be eligible, students needed to have completed at least four semesters, and therefore the questionnaire was directed toward third-, fourth-, and fifth-year students. The targeted group was chosen because these students had significant exposure to the design studio environment and could provide meaningful insights into pedagogical practices. The third-year students shared experiences and views from their first studio exposure. Fourth-year students reflected on stages in between. Fifth-year students provided an understanding of what happens during advanced design studio work-experiences, allowing an all-encompassing understanding across levels (Kowaltowski et al., 2012).

The purpose of this study was to gather data on students' experiences and perceptions of design studio pedagogy, specifically focusing on instructional approaches, integration of theoretical and practical knowledge, and learning models in architectural education. A systematic questionnaire was created using Google Forms, incorporating both multiple-choice questions and open-ended prompts for suggestions and comments.

Rationale for Survey Structure

- The multiple choice questions provided empirical data, within which patterns and trends could be analyzed among students' perceptions.
- On the other hand, the open-ended questions allow qualitative insight, thus broadening understanding of individual experiences and subtle feedback (Creswell & Plano Clark, 2017).

The formulation of each question related to the research aspect, keeping to the objectives of the literature review:

- **Organization of Idea in Design Studio:** Based on Goldschmidt and Tatsa's (2005) emphasis on structuring ideas, this question assessed students' experiences organizing their creative processes.
- **Balancing Creativity and Feasibility:** Inspired by Casakin and Kreitler (2008), this explored learning of how students Navigate innovative and essentially practical design aspects.
- **Metacognitive Processing:** Aligned with Hargrove and Nietfeld's (2015) findings, this question investigated students' self-awareness of their thinking processes when performing design projects.
- **Connections with Design Thinking and Self-Directed Learning:** Rooted in Kolb's (2017) and Leary's (1957) theories, this study examined how students perceive the relationship their learning strategies have with the design outcome.

The majority of the people, living in shared houses around 81 percent come from out of the city. The long-distance working or educational place with huge traffic congestion of the city leads to leaving the parental house and their proportion is 16 percent while the rest 3 percent of young people shared house seeking better educational environment than their home. This result indicates that young people in Dhaka city choose this single living lifestyle only when they face a situation of crisis or urgency rather than for enjoying an independent lifestyle or a better environment as seen in many developed countries.

By linking the survey structure to the literature, the questionnaire was designed not as an isolated tool but as a method to validate and expand upon existing research frameworks.

Survey Distribution

The survey was distributed through a combination of social media platforms and direct outreach to Heads of Departments (HODs) and faculty members in architectural schools across Lahore. This multifaceted approach ensured broad participation from students across diverse institutions.

Rationale for Distribution Strategy

- **Social Media**: Such platforms like WhatsApp and Facebook would have made rapid spreading and easy access very simple for the students, particularly since they are digital natives and devote a lot of their time to such platforms (Kaplan & Haenlein, 2010). This was a method for reaching as much of the Lahore area as possible, ensuring broad-based inclusivity.

- **Direct Outreach**: This strategy made certain the survey could reach up to the dead centre target by providing institution credibility and participation through networks. Very efficient encouragement of responses for students too poor in interest to speak up in a social media discussion was possible using this method.

Impacts on Survey Results

- The role of social media in boosting turnout rates, as well as in diversifying response types, which demonstrated a variety of established institutional practices.

Figure-1: Gender Distribution

- Direct approach ensures the appropriateness and reliability of data by bringing such accounts into the study; typically, young people with no relevant experience would be less likely to respond to the survey.

It might be the fact that that dual approach might have biased the actual research, because this very particular student group consists of only those who are more active on social media as young and digitally engaged individuals while those who have responded via institutional channels are much less likely to reveal their answer using a more formal and thus academic perspective (Creswell, 2013).

Participants

A total of 110 responses were collected. The gender distribution of participants was 43% male and 57% female. In terms of academic standing, 39.6% of the respondents

Table-2: Institution Participation

Institution	Participation Percentage
University of Engineering and Technology (UET)	21.80%
University of South Asia (USA)	19%
COMSATS Institute of Information Technology	12%
Punjab Tianjin University of Technology (PTUT)	9.90%
Lahore College for Women University (LCWU)	8.10%
Institute for Art and Culture (IAC)	7.20%
National College of Arts (NCA)	3.60%
University of Management and Technology (UMT)	1.80%
Beaconhouse National University (BNU)	1.80%
University of Lahore (UOL)	0.90%
Superior University	0.90%

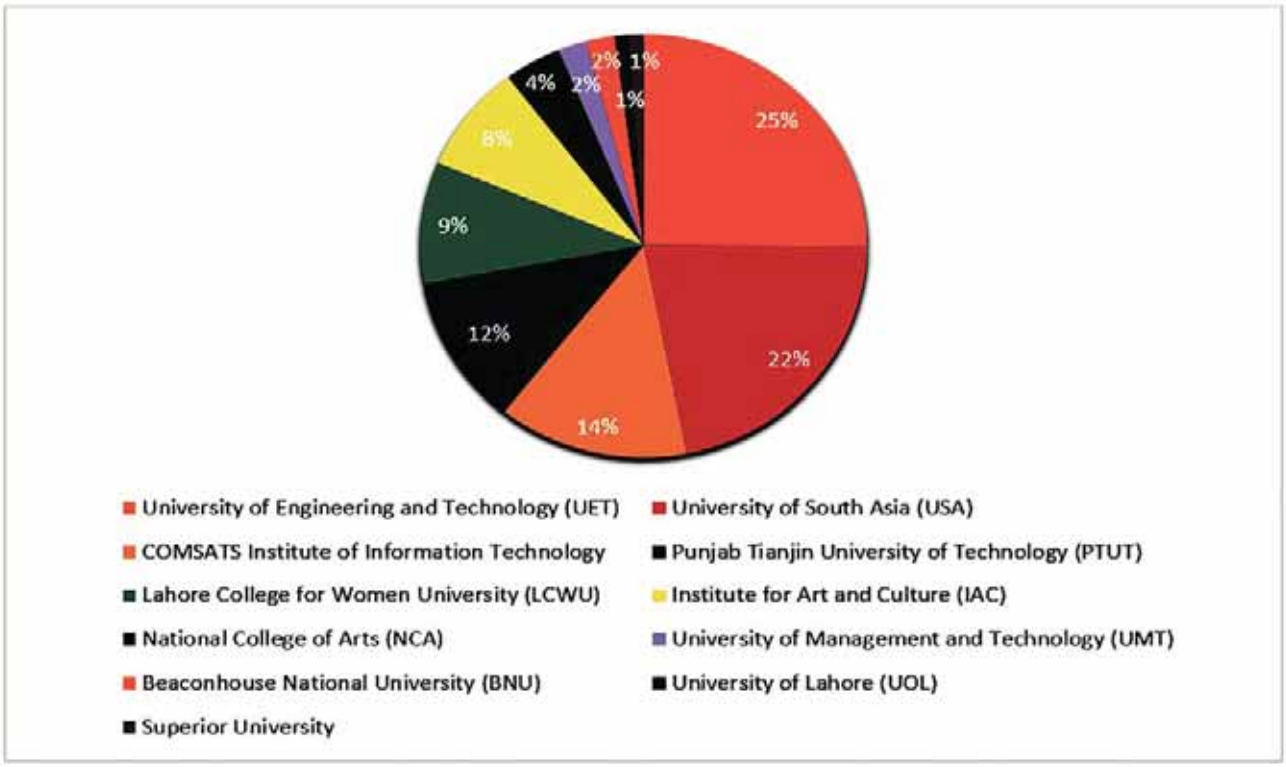


Figure-2: Institution Participation

were in their third year of study, while 29.7% were in their fourth year, and 30.6% were in their fifth year.

Institutional Participation

Students from a diverse range of institutions participated in the survey, providing a comprehensive overview of design studio pedagogy across Lahore. The institutions and their respective participation rates are as follows:

Data Analysis

The data obtained from the surveys were analyzed using descriptive statistics to summarize responses and identify patterns. Popularized by the findings, it also extended to the computation of frequencies, percentages, and distributions involved for multiple-choice questions concerning what would now be known as the trends in student perception and experiences (Field, 2018).

The qualitative responses were analyzed using thematic analysis, a widely recognized method for identifying, analyzing, and interpreting patterns of meaning within qualitative data (Braun & Clarke, 2006). This approach was employed to explore students' experiences and perceptions of design studio pedagogy, focusing on recurring themes such as challenges in balancing creativity and feasibility, the role of reflective practices, and the perceived impact of instructional strategies. Thematic analysis has been chosen for obvious reason: it captures both explicit and implicit patterns in data, which is really useful for open-ended survey responses.

The mixed-method approach provided a comprehensive understanding of pedagogy in the design studio. Quantitative analysis helped establish clear patterns and trends, while qualitative analysis offered deeper insights into student experiences and feedback. This allowed researchers to coordinate findings with each other, making sure that a complete interpretation would understand the data (Creswell & Plano Clark, 2017).

RESULTS AND ANALYSIS

Perspectives on Instructional Approaches in the Design Studio

Design Studio Configuration

Organization of Ideas in Design Studio Projects

Survey Question1

"How do you feel about the organization of ideas during your design studio projects?"

Table-3: Result of Survey Question 1

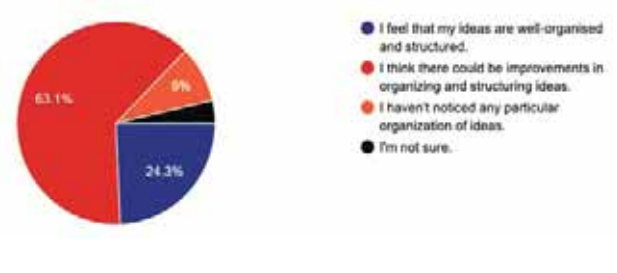


Table-4: Result of Survey Question 1

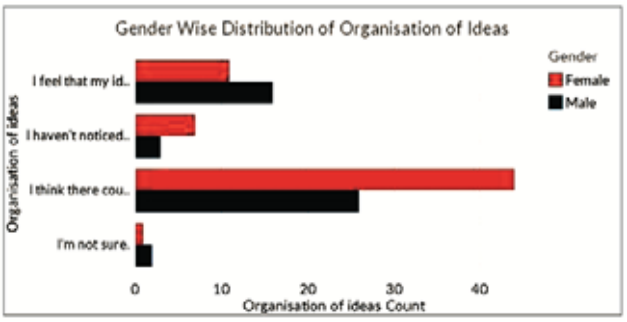


Table-5: Result of Survey Question 1

Table-6: Result of Survey Question 2

Clarification

This question refers to the organization of ideas both by the students and as facilitated by teachers in the design studio environment. The importance of structured idea generation is highlighted in the works of Goldschmidt and Tatsa (2005), who underscore the value of qualitative and quantitative structuring in the creative process.

Response Distribution

- 24.3% of students reported that their ideas are well-organized and structured.
- 63.1% felt that there could be improvements in organizing and structuring ideas.
- 9.0% did not notice any particular organization of ideas.
- 3.6% were unsure.

Analysis

Gender distribution and year of study distribution do not significantly affect the overall proportions of the responses, as the perspectives of students remain consistent across different demographics. The majority of students (63.1%) believe that there is room for improvement in the organization and structuring of ideas during design studio projects. This feedback aligns with the literature, which emphasizes that structured interventions in idea organization can enhance creativity and learning outcomes (Asefi & Imani, 2011).

Teachers play a pivotal role in guiding students through structured thinking processes, providing frameworks that enable better organization and development of ideas. Addressing this gap in pedagogy could significantly improve students' ability to tackle design challenges effectively.

Survey Question 2

"What aspects of design creativity do you focus on the most during your projects?"

Response Distribution

- 21.8% focus on operational aspects and practical considerations.
- 31.8% prioritize innovative and creative aspects.
- 41.8% give equal importance to both operational and innovative aspects.

Analysis

A plurality of students (41.8%) reported balancing both

Table-7: Result of Survey Question 2

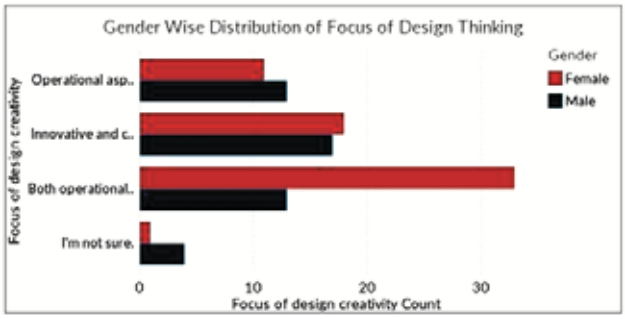


Table-8: Year of Study Distribution chart for Question 2

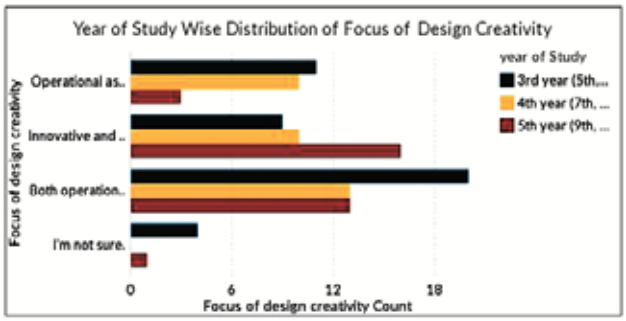
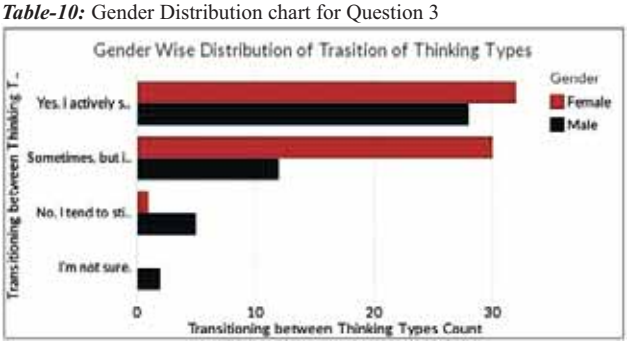


Table-9: Result of Survey Question 3

Table-10: Gender Distribution chart for Question 3



operational and innovative aspects of design equally. This reflects a growing awareness of the importance of merging creativity with practicality. A significant portion (31.8%) prioritizes innovative aspects, suggesting that students place high value on originality in design.

Gender distribution reveals notable differences. A majority of female students give equal importance to operational and innovative aspects, while a significant number of male students prioritize innovative and creative aspects. In terms of year-wise distribution, third-year students tend to balance both aspects equally, while fifth-year students focus more on innovation, often at the expense of operational aspects.

This finding is consistent with the literature, which argues that striking a balance between creativity and feasibility is crucial for comprehensive design solutions (Kowaltowski et al., 2012). Educators can address these tendencies by encouraging female students to explore more innovative approaches while guiding male students to integrate practical considerations into their designs. Such balanced instruction could foster a more holistic design education.

Transition Between Different Types of Thinking

Survey Question 3

"Do you find yourself transitioning between different types of thinking during the various stages of your design projects?"

Response Distribution

- 54.5% actively switch between different thinking modes.

- 38.2% sometimes switch, but it is not a deliberate process.

- 5.5% tend to stick to one type of thinking throughout.

- 1.8% were unsure.

Analysis

More than half of the students (54.5%) actively transition between different thinking modes during design projects, demonstrating flexibility in their cognitive approaches. However, 38.2% do not consciously make these transitions, indicating a potential gap in their metacognitive awareness.

Gender analysis shows differences in intentionality. Female students are more likely to transition modes without deliberate intent, whereas male students tend to approach these shifts intentionally. Additionally, a small number of male students reported sticking to one mode throughout, an observation absents among female respondents.

This aligns with Hargrove and Nietfeld's (2015) findings, which emphasize the importance of deliberate associative thinking in developing creativity. Educators can address this by incorporating reflective practices, such as journaling or guided discussions, to help students become more conscious

Table-11: Year of Study Distribution chart for Question 3

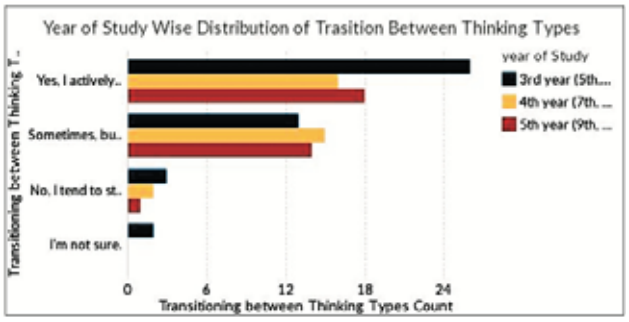


Table-12: Result of Survey Question 4

Table-13: Gender Distribution chart for Question 4

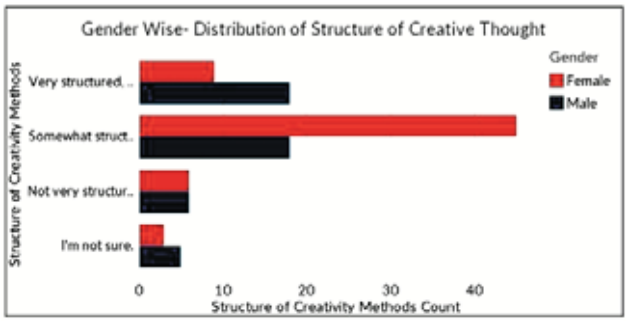
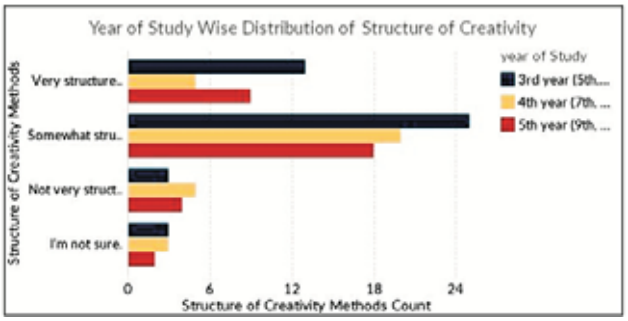


Table-14: Year of Study Distribution chart for Question 4



of their cognitive transitions. These strategies could enable all students to harness the benefits of flexible thinking more effectively.

Structure of Creativity Methods

Survey Question 4

"How structured do you find the application of creativity methods in your design studio projects?"

Response Distribution

- 24.5% found the methods very structured with clear guidelines.

- 57.3% found them somewhat structured but felt there could be improvements.

- 10.9% felt the methods were applied in an ad-hoc manner.

- 7.3% were unsure.

Analysis

A majority of students (57.3%) perceive the application of creativity methods as somewhat structured but believe there is room for improvement. This aligns with Kowaltowski et al. (2012), who emphasize that structured creativity methods can significantly enhance student outcomes by providing consistent frameworks for design exploration.

The ad-hoc application of these methods by some students (10.9%) further underscores the need for standardized and clearly articulated creativity techniques in the design studio. Although the year-wise distribution matches overall trends, there is a notable spike in the perception of creativity methods as somewhat structured but needing improvement among female students.

Male students, in contrast, are more divided, with a substantial portion perceiving the methods as very structured with clear guidelines, while others share the female students' view of needing improvement. These gender-based differences highlight the importance of tailoring creativity techniques to meet diverse student needs, a recommendation also supported by Casakin and Kreitler (2008).

Cultivating Creativity

Role of Reflection on Experience in Enhancing CreativitySurvey

Question 5

"How do you perceive the role of reflection (understanding

Table-15: Result of Survey Question 5

Table-16: Gender Distribution chart for Question 5

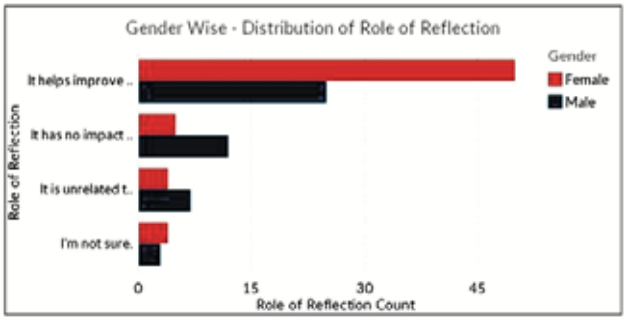


Table-17: Year of Study Distribution chart for Question 5

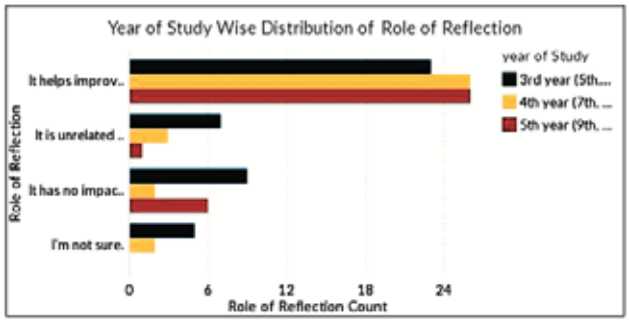
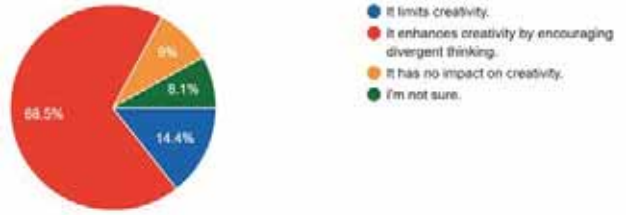


Table-18: Result of Survey Question 6



the bigger picture and its consequences) on experience in enhancing creativity during studio projects?".

Response Distribution

- 15.5% believe it has no impact on creativity.
- 68.2% believe it helps improve creativity through meaningful learning.
- 10% believe it is unrelated to creativity improvement.
- 6.4% were unsure.

Analysis

A large majority (68.2%) of students believe that reflection enhances creativity by promoting meaningful learning. This finding reinforces the work of Alterio and McDrury (2003), who emphasize reflection as a critical component of significant learning in design projects.

However, 15.5% of students believe that reflection has no impact on creativity. These students may benefit from structured opportunities for reflection, such as guided journaling or peer discussions, to better understand its role in the creative process.

Gender distribution shows that a higher proportion of female students recognize the value of reflection compared to male students, some of whom feel it has no impact. Year-wise distribution indicates a divergence, with third- and fifth-year students more likely to believe that reflection is unrelated to creativity improvement, while fourth-year students align with the majority trend. This suggests that targeted interventions, such as reflective workshops tailored by academic level, could help bridge these gaps in perception (Hargrove & Nietfeld, 2015).

Impact of Unusual Experiences on Creativity

Survey Question 6

"How do you think exposure to unusual experiences and situations affects creativity in design studios?"

Response Distribution

- 14.5% believe it limits creativity.
- 69.1% believe it enhances creativity by encouraging divergent thinking.
- 8.2% believe it has no impact on creativity.
- 8.2% were unsure.

Table-19: Gender Distribution chart for Question 6

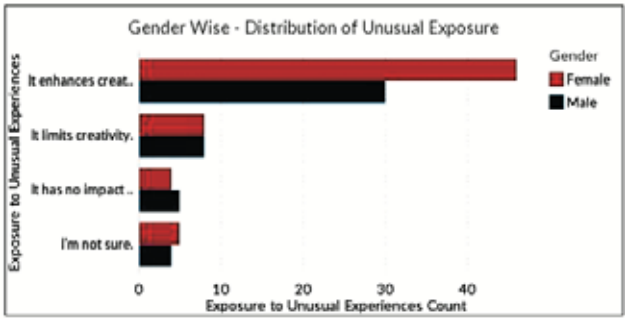


Table-20: Year of Study Distribution chart for Question 6

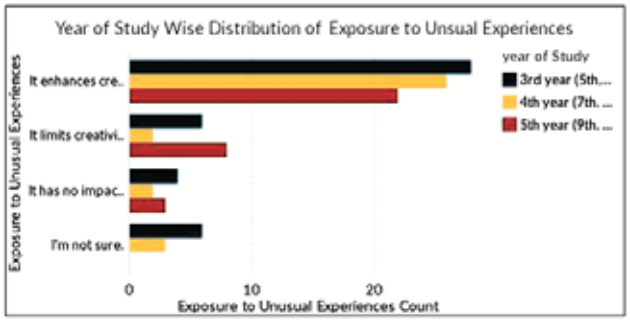
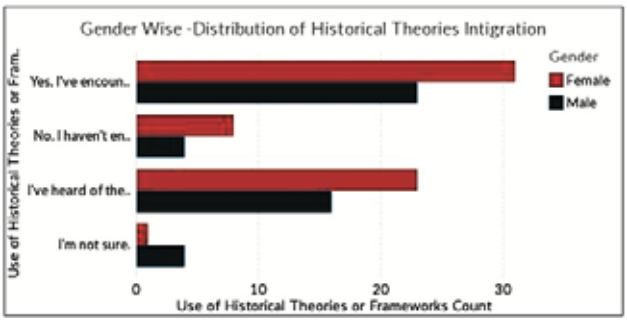


Table-21: Result of Survey Question 7

Table-22: Gender Distribution chart for Question 7



Analysis

The majority of students (69.1%) believe that exposure to unusual experiences enhances creativity by encouraging divergent thinking. Bhattacharya et al. (2014) support this view, highlighting how unconventional experiences stimulate original responses to design challenges.

The small percentage (14.5%) who believe it limits creativity suggests that some students may feel overwhelmed or constrained by novelty. This aligns with the idea that not all students are equally equipped to handle the ambiguity associated with unconventional scenarios (Hargrove & Nietfeld, 2015). Targeted strategies, such as preparatory exercises that gradually introduce novelty, could help these students adapt and thrive in such situations.

Gender and year-wise distributions show consistency with the general trend, reinforcing the broad recognition of divergent thinking's value in the design process.

Integrating Theoretical and Practical Knowledge in Design Studios

Encounter with Historical Theories and Frameworks

Survey Question 7

"Have you encountered the use of historical theories or frameworks like typology in guiding your design process?

Response Distribution

- 49.1% have encountered and utilized such frameworks.

- 35.5% have heard of them but haven't used them in their projects.

- 10.9% have not encountered them in their design projects.

- 4.5% were unsure.

Analysis

Approximately half (49.1%) of the students have applied historical theories or frameworks, indicating some integration of traditional knowledge into contemporary design practice. However, the 35.5% who have only heard of these frameworks without applying them highlights a gap in connecting theoretical knowledge to practical design tasks.

Turkan et al. (2010) emphasize the importance of explicitly linking theoretical content to design studio projects to bridge this gap. Gender distribution matches the general trend, but year-wise distribution reveals a significant challenge at the fourth-year level, where students report having heard of frameworks but not using them in their projects. This suggests a need to strengthen curricula at this stage, emphasizing applied historical analysis in design tasks.

Table-23: Year of Study Distribution chart for Question 7

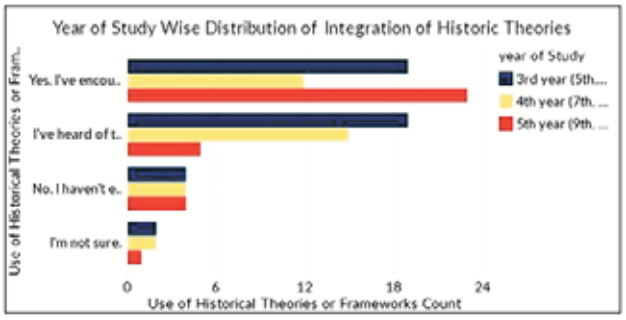


Table-24: Result of Survey Question 8

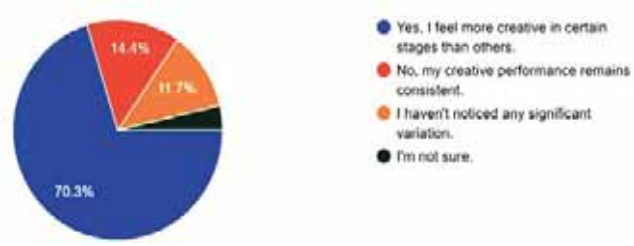


Table-25: Result of Survey Question 8

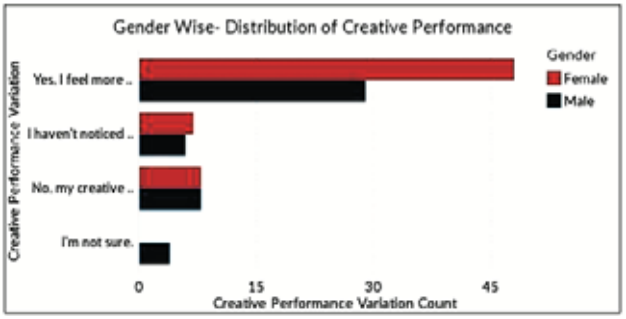
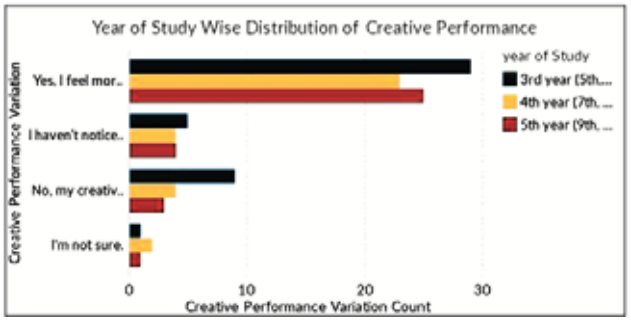


Table-26: Year of Study Distribution chart for Question 8



Learning Models in Architectural Education

Variation in Creative Performance

Survey Question 8

"Do you feel that your creative performance varies throughout the different stages of the design process?"

Response Distribution

- 70% feel more creative in certain stages than others.
- 14.5% feel their creative performance remains consistent.
- 11.8% haven't noticed any significant variation.
- 3.6% were unsure.

Analysis

A significant majority (70%) of students reported that their creative performance varies throughout the design process, suggesting that certain stages may inherently foster more creativity than others. This variability in creative performance highlights the importance of identifying and enhancing the stages of the design process where creativity tends to flourish, while also exploring ways to maintain or boost creativity in other stages.

Gender distribution and year-wise distribution show the same trend, indicating that this variability in creative performance is consistent across different demographics. This consistency suggests that educators should focus on developing strategies that support creativity throughout all stages of the design process, benefiting a broad range of students.

Impact of Metacognitive Processing

Survey Question 9

"How do you think metacognitive processing (thinking about one's own thinking and learning) affects your design thinking and making?"

Response Distribution

- 40.9% believe it significantly enhances their design process and outcomes.
- 40.9% believe it has some impact, but they are not sure how significant it is.
- 10% do not think it impacts their design.
- 8.2% were unsure.

Table-27: Result of Survey Question 9

Table-28: Gender Distribution chart for Question 9

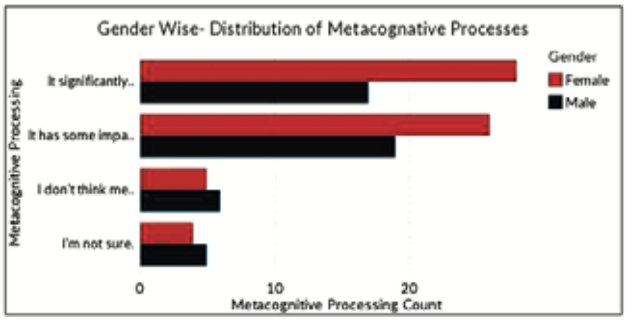


Table-29: Gender Distribution chart for Question 9

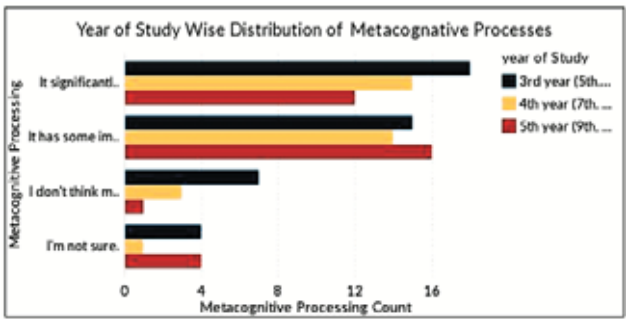


Table-30: Result of Survey Question 10

Analysis

Students are evenly split between those who believe that metacognitive processing significantly enhances their design process (40.9%) and those who recognize some impact but are unsure of its significance (40.9%). This reflects an awareness of the importance of self-reflection in design thinking, though there may be a need for further emphasis on metacognitive strategies to help students fully appreciate and leverage their benefits. The pattern is the same in gender distribution and year-wise distribution, indicating that this split in perception is consistent across different groups of students. This suggests a universal opportunity to reinforce the value of metacognitive strategies in the design studio.

Relationship Between Design Thinking and Self-Directed Learning

Survey Question 10

"Do you believe that design thinking is closely related to self-directed learning?"

Response Distribution

- 63.6% see a strong relationship between design thinking and self-directed learning.
- 20.9% are unsure about the relationship.
- 10.9% do not think there is a significant relationship.
- 4.5% were unsure.

Analysis

A strong majority (63.6%) of students perceive a close relationship between design thinking and self-directed learning, suggesting that students who engage in self-directed learning may be better equipped to apply design thinking principles. This indicates that fostering self-directed learning skills could enhance students' overall design capabilities, making them more effective and independent thinkers.

Gender distribution and year-wise distribution show the same trend, reinforcing the idea that this perception is consistent across different groups of students. This consistency further highlights the importance of integrating self-directed learning strategies into the design education curriculum.

Integration of Creative and Critical Thinking

Survey Question 11

"If creative thinking involves an open approach to new ideas,

Table-31: Gender Distribution chart for Question 10

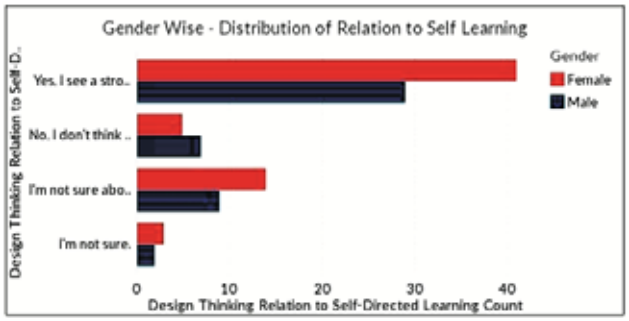


Table-32: Year of Study Distribution chart for Question 10

Table-33: Result of Survey Question 11

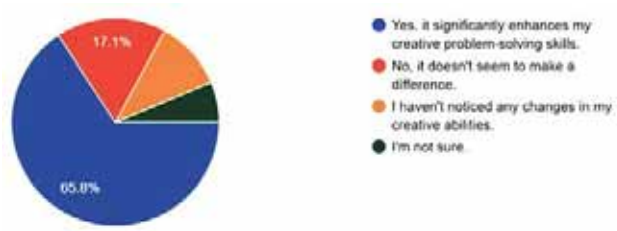
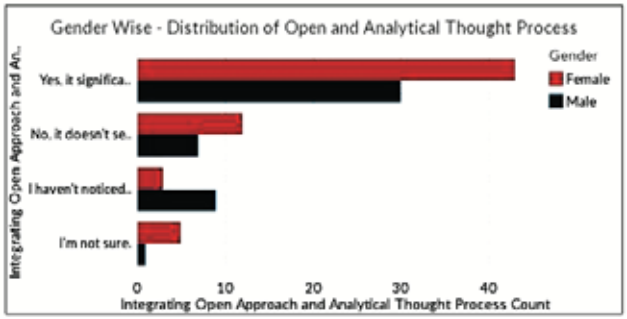


Table-34: Gender Distribution chart for Question 11



and critical thinking involves an analytical thought process, have you found integrating both types into studio activities helpful in enhancing your superior cognitive development?"

Response Distribution

- 66.4% believe it significantly enhances their creative problem-solving skills.
- 17.3% do not believe it makes a difference.
- 10.9% haven't noticed any changes in their creative abilities.
- 5.5% were unsure.

Analysis

A substantial majority (66.4%) of students reported that integrating both creative and critical thinking significantly enhances their problem-solving skills, suggesting that the combination of these cognitive approaches is essential for superior cognitive development. The students' recognition of the value of this integration highlights the need for studio activities that actively promote both creative exploration and critical analysis. Gender distribution and year-wise distribution do not show any deviation from the general response result, indicating that this perception is consistent across different groups of students. This reinforces the importance of fostering both creative and critical thinking in the design studio.

Approaches to Design Strategies

Survey Question 12

"What approach yields the best results in terms of solution quality and creativity?"

Response Distribution

- 20% believe intuition-based design strategies yield the best results.
- 52.7% favor problem-driven design strategies.
- 16.4% prefer trial-and-error design strategies.
- 10.9% were unsure.

Analysis

A significant majority of students (52.7%) favor problem-driven design strategies, indicating a preference for structured, analytical approaches that focus on solving specific design challenges. Intuition-based strategies, while still valued (20%), are less favored, suggesting that while creativity is essential, students feel more confident in approaches that offer clear pathways to solving design problems. This result underscores the importance of teaching both intuitive and problem-driven methods to allow students to develop a well-rounded design approach. Gender distribution and year-wise distribution align with this general response, reflecting a

Table-35: Year of Study Distribution chart for Question 11

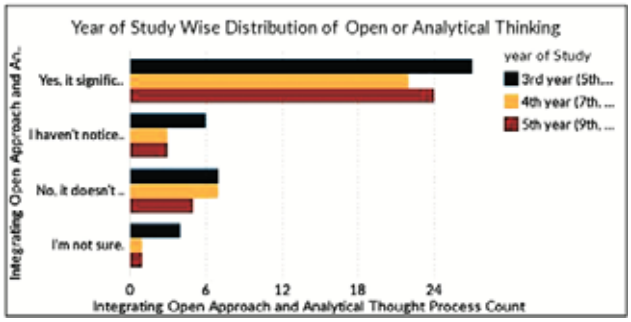


Table-36: Result of Survey Question 12

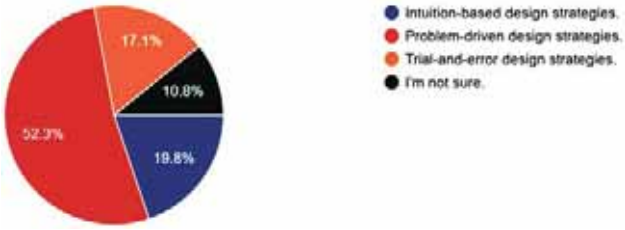


Table-37: Result of Survey Question 12

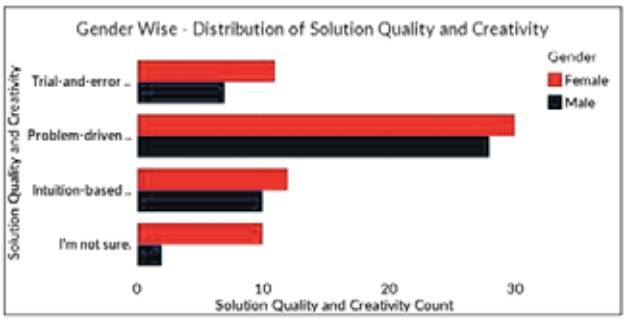
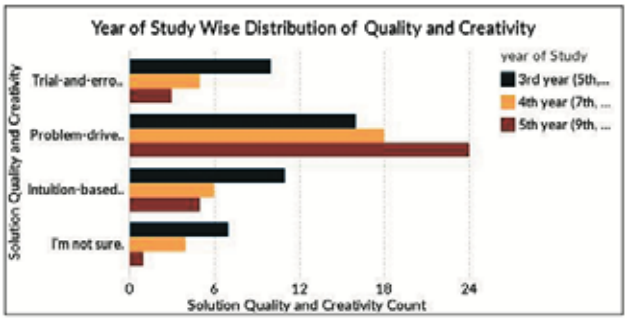


Table-38: Year of Study Distribution chart for Question 12



consistent preference for problem-driven strategies across different student groups.

Qualitative Analysis

Aside from the evaluated, quantifiable nature of the data, encapsulated in the survey portion, a range of open-ended responses given by students serve as added means for exploring their experience and point of view perspective paradigm around learning in the program:

- Architecture Frustration: One provided a considerable dislike of architecture with potential realities of frustration or dissatisfaction with the educational experience.

- Practical vs. Aesthetic Balance: A number of students noted a lack of balance between practical experience and aesthetic on the educational spectrum, noting a desire for more "real-world" applications or hands-on experience.

- Influence of instructors: One response noted how understanding instructor strengths and unique villages absorb students' thought processes and creative paths, limiting creative processes.

- Mix of creativity and function: One 5th student noted the value of mixing creativity and technicality with degree of value afforded for both aesthetics and purpose. Careful attention to pursue holistically the intention of functionality in designs through a balance of creativity and critical functionality equally valued in design process.

Result Summary

The results of the Pedagogy Survey carried out in the Design Studio provided a contextual lens of student experiences and perceptions. Students acknowledge value in creativity, structure, and applicability for their education, but we have substantial opportunities to refine pedagogical practice around the arrangement of ideas and methods of creative thought, and balancing creativity (e.g., free thought) with pertinence or relevance (e.g., descriptive or prescriptive thought). Using qualitative feedback demonstrated to be advantageous in a survey format, teacher feedback also indicated students desire, "... an individualized and flexible approach to teaching, emphasizing real-life practice and experiential learning" (feedback, Student One). This analysis of findings serves as a framework of consideration for refinement in studio-based design education (for the sake of creativity), in terms of impacting in-studio student learning and experiences.

DISCUSSION

The survey results indicate a complex situation with regards to architectural education in Lahore, specifically in relation to students' views on the balance between creativity and practicality, the organization of ideas, and reflective practice. There are good indicators and areas of potential

developmental concern in design studio pedagogies that emerge from this research.

Firstly, the alignment among the gender and year of study perspectives about the pedagogy implies that students share a belief that their ideas with regard to design project would benefit from better organization and structuring. This agrees with Goldschmidt and Tatsa (2005) about the benefits of ideas being organized and structured qualitatively and quantitatively in the design process. Secondly, however, the differences in male and female student preferences for innovation or operation still seem to warrant design studio to be flexible and multiple perspectives to balance better these two essential aspects of design. The research findings identify a tendency for female studies to allow both aspects equal opportunity while male studies seemed to favor innovation more, and other factors seem at play such as Pakistan culture and traditional beliefs about what is valued with regards to the role of creativity and practicality.

Example of Teacher Intervention: One possible intervention for educators in Lahore might include intentionally instructional exercises that have students employ both practical actions and engaging their creativity. For example, an educator may ask their students to first brainstorm creative design concepts through a series of practice activities and ask the students to then create thorough technical plans for execution. Another approach might ask the students to work in teams with both a male and female, or one innovative or automotive professional, for the purpose of mutual learning and developing a more integrated design methodology.

The survey additionally indicates that many students switch between different thinking orientations while working through their design projects, with a large proportion of them not consciously doing so. This evidence provides support for educators to offer some structured activity that helps develop thinking flexibility, as suggested by Asefi and Imani (2011).

Female students, in particular, would benefit from prompts that support them to become more intentional about these cognitive shifts.

Example of Teacher Intervention: One potential design for teachers would be to integrate reflective tasks such as "design journals" in which students catalogue their thought process while working through the project. Teachers could ask students to examine their diaries and identify shifts between different modes of thought (e.g., creative versus analytical modes of thought), and talk about how these shifting modes operated and affected the outcome. Exposing students in an active manner would likely be a very beneficial way for students to become aware of their modes of thought, and shift to demonstrate abilities to adapt to more instances of design thinking and multiple aspects of design challenges.

Reflective practice is a vital mechanism for building creativity in architectural education. It is well-documented that the near-unanimous student perception that reflection supports creativity is telling of its importance, as Alterio and McDrury (2003) discuss. However, the percentage of students who do not believe that reflection is valuable (both of which were below the proportion of students who did) indicates that structured opportunities need more opportunities for reflective practice to practice reflection.

Example of Teacher Intervention: One simple way instructors could engage their students would be an exercise titled "reflection week," where students revisit their major project in relation to their decisions. Teachers could engage students in some way, such as discuss the decisions that students made at different points in their project, such as initial brainstorms or sketches, through practice replica decisions from the project they were able to adapt or generally overall about their work on it. In these teacher-facilitated discussions or workshops, students simply would consider what they learned from the project, what they would do differently, or how decisions substantiate the use of creativity or practicality in their choices. The "reflection week" organized, from teachers would weave into the fabric of the course, the possibility of peer reviews for students to give and receive feedback. This would also potentially deepen the students understanding both their own work and work of others.

The need for improvement exists in the area of the integration of theoretical to practice in the design studio. The survey results show that students felt exposure to historical theories and frameworks, but that learning theory was remiss when the students went to made design projects. This is consistent with a finding from Turkan et al. (2010) at Bilkent University, which showed that students referenced the connections between technical courses and design projects, but less so with historical or theoretical knowledge.

Example of Teacher Intervention: To "facilitate" this linkage, educators could formulate assignments that would compel students to apply historical and theoretical ideas directly in their designs. For example, the students could design a modern building that incorporates aspects of particular historical architectural movement into their project, explaining how the principles were incorporated into the design. In this area, educators could also organize "theory-to-practice" workshops, wherein students would study case

studies of buildings that incorporate historical theories into contemporary work successfully. This could serve two purposes by (1) reinforcing the importance of theoretical knowledge, while support (2) the predictability of their practice by demonstrating their application to student work.

Finally, the findings show that self-directed learning and metacognitive processing is significant consideration for the design process. Student did appreciate the importance of metacognitive strategies for self-directed learning regarding, yet there is questionable how much they stood behind the idea metacognitive processing positively impacted the design process when using strategies. The students appreciated self-reflection from the designer thinking scope but ideological did not feel they were firmly taking advantage of these versatility of thinking tools.

Example of Teacher Intervention: Educators could facilitate the experience each week to change or minimize negative self-efficacy influences of rationale/purpose with "pause and reflect" reminders placed at different junctures during studio session, for examples these could occur during design critiques if students were directed to take just a moment to consider why they went down any particular design tangential listening to the questions such as "Why was that an approach?" or "Why was that decision made? “How does this decision relate to the project’s objectives?” These prompts may help students become aware of their thinking strategies and impact on their design outcomes. Furthermore, using self-assessment rubrics with criteria around which students evaluate their work would also support the development of metacognition.

The observed strong connection that students made between design thinking and self-directed learning in our design studio illustrates the value of developing self-directed learning capabilities in the studio environment. This is all the more relevant and pertinent in relation to Kolb's (2017) learning cycle theory that positions architectural students, as 'Accommodators' within the learning conditions afforded by contemporary design studio learning environments, being hands-on, as those who learn best from the experience they get from an exercise. Self-directed learning is especially valuable and appropriate in Lahore where the learning resources available may be limited which may not allow for the development of learners as effective independent thinkers.

A possible example of educator intervention might involve educator-develop self-directed, student led projects where students are able to choose their own topics or areas of interest within a more broadly stated design challenge. For example, the final project in the course might involve the design of a public space. Each student could select and focus on an aspect to guide their design, such as sustainability, cultural relevance, or technology. In providing self-directed guidance and learning resources, educators, should not take over students' research and decisions as that runs counter to the intent of the exercise. In doing so, students can take ownership of their learning and develop the confidence and skills necessary to be an independent learner and tackle complex design problems independently.

Finaly, students’ inclination toward problem-driven design approaches suggests that while there is an understanding of creativity, there is a preference for methodical and analytical processes in design. This result is consistent with Leary’s (1957) Interpersonal Theory of Personality which showed that a student’s style of design is likely the same as their style of personality.

Example of Teacher Intervention: Teachers may help balance problem-driven and intuition-based strategies by using a phase-based structure for studio projects. The first phase can include analytical problem-solving where students specify and solve design problems, while the second phase would promote an intuitive and open exploration of design processes to invent creative solutions outside of the original problem. This type of phased approach will incorporate analytical and creative skills without being unequivocally anchored to one or the other, and would help students become more well-rounded in his or her design process.

CONCLUSION

This research study ultimately articulates major concerns regarding present-day architectural education in Lahore, illustrating particularly which areas need improving in relation to design studio pedagogy. Closing the gaps identified for example, through better framing of ideas, creating cognitive flexibility, infusing reflective practice, and enhancing articulation of theory and practice, which may foster a more supportive and engaged learning environment.

In addition, it is crucial to recognize that importing pedagogical frameworks without first rigorously testing them in the local context may lead to ineffective or misaligned outcomes. Educational practices suited to the realities of the region, culturally or practically are critical to ensuring that architects are educated to engage locally relevant work and ideas. These improvements are not merely beneficial but essential for cultivating architects who are innovative, adaptable, and well-prepared to meet the demands of contemporary architectural practice. As the profession continues to evolve, so must the educational frameworks that prepare future architects, making these pedagogical advancements both timely and necessary.

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