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Using overlapping fields in design-build assignments to retrieve the architectonic situation in architecture schools

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Abstract
Architects are seeking to bridge the design-construction divide. This approach, which seeks to retrieve the situation in which there is no distinction between design and construction, attempts to address an integrated educational pedagogy by linking origins and providing opportunities and challenges for undertaking thought-practice tasks. To accomplish this integration, the article investigates the usage of an overlapping field with architecture in design-build projects. Architecture and intertwining have a same background. This action research analyzes the experience of exploiting their overlap in designing and building a light awning at Yazd University in Iran's architecture school. The methodology includes analyzing the lived experience of freshmen (N = 24) through pictures, memoranda, and observations and comparing it to secondary feedback from alumni (N = 24) obtained via questionnaire. As found, analogy-based journeys to the intersections provide architectural decision-making situations like material selection, structural pattern recognition, manufacturing concepts, and a holistic viewpoint for component arrangement. Similarity exists when two fields have at least one function, behavior, or structure in common. In this study, structure serves as a strong junction at the form and concept level. This approach guides the experience of the aimed situation, named "architectonic situation," which is context-sensitive and attempts to provide a comprehensive image to introductory studios. This reality-based approach includes three parts: students, an assignment subject, and a field that overlaps with architecture. It could be recommended to schools that seek to connect with their cultural roots as part of their mission.

Keywords
Architectonic, Architectural education, Material affordance, Structure patterns, Thought-practice.

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1. Introduction

Two extremes are noted based on the phrase "design": one detects a mental process to plan a scheme, and the other belongs to conducting an action. Take note of this nature, as it encounters a match for creation. The dual aspect of design informs our understanding of architecture as a field, not merely a discipline. The nature of architecture might be rethought through the etymology of Latin architectonicus, architectonic, from Greek arkhitektonikos, from arkhitekton, architect (The American Heritage Dictionary, 2001). Karl Bötticher (1806–1889), who studied ancient Greek architecture, used the architectonics phenomenon in the description of architecture (Kozlov, 2018). The contemporary term "architectonic" has been defined in this way: 1) of, relating to, or according with the principles of architecture : Architectural 2) having an organized and unified structure that suggests an architectural design (Merriam-webster dictionary, 2020). This term consists of two parts: architecture and tectonic. Kim (2006) asserted that architectonic was closely related to three terms: 1) techné, technique, and technology; 2) construction and structure; and 3) stereotomics. She added that tectonic refers to the skill of framing structures with materials.

Sanders Peirce (1839–1914) believed that architectonic subject matter is the framework of all human knowledge on a large scale (Atkin, 2004). Through the Bakhtinian utopia of dialogue, Matilianen (1998, p.36–44) stated that architectonics and dialogism may be viewed as opportunistic attempts to address issues and that there is a need to return to architectonics. Authenticity and the possibility of becoming other were considered architectonic crises by him. Atkins (2014) claimed that architectonics is a lost science that has gained prominence as a result of the question of how philosophy and practical domains intersect and interact. Depew (2010, p.37) reintroduced architectonic producing art as Richard McKeon's theory, which argued about earlier analogies before his time and the practical character of architectonic while observing a coherence in thinking. He defined architectonic as a holistic perspective that integrates and organizes thought and practice and is valid in a subject-free creative process.

Because of the architectonic nature, one of its features in the architecture field relates to the structure's role on two levels. Ilkovičová and Ilkovič (2019) described the poetry of structure as bringing unity and harmony to constructing pieces so that removing one element disrupts the entire harmony. They contended that the achievement of this oneness is possible through architectural education. Furthermore, Behnejad et al. (2015) recognized the significance of the relationship between architecture and structure in the studios during the creative stage of the architectonic-construction idea. The structure in architectonic produces an order for a whole, with numerous components aimed at achieving usefulness at the level of organization. Materiality is another aspect of architecture that is anchored in face tectonic. According to Karana et al. (2015), a useful way to consider materials' experiences is on three levels: aesthetics, meanings, and emotions that emerge from context, time, and subjective, perception, and sensory information qualities. Each material's nature has inherent features such as affordances that induce similarities to products manufactured from the same substance.

According to Vatan (2017), employing the same material in different circumstances always results in innovation due to variances in the process and cultural preferences. According to Ashby and Johnson (2010), becoming familiar with material affordances contributes to the art and science of material selection. Materials lead to meaningful tectonics that is anchored in the field's character. Carlson-Reddig (1984) addressed honest materials and reasonable tectonics, which both are actively promoted today.

According to the scholars, when we enter architecture through the architectonic entry, we do not encounter a mismatch between concept and practice. However, architecture has been known as a discipline in academic education, and that comprehensive vi-

sion is often overlooked. The role of integrating thought and practice in architectural education has been revised in recent decades. One of the outputs is the term "design-build," which represents the goal of bringing two noticed faces together. Delport (2016) identified design-build as a border interface that differed from other pairings such as theory-practice or abstract-concrete. According to Lahdenpera (2001), the design-builder is responsible for both design and building. Nevertheless, design-build is not a strict system; there are numerous possible operating modes and procedures to choose from, each of which gives different operational alternatives. During the design-build process, audiences must become well-versed in a variety of understanding tools that highlight the hearts and minds rather than simply the hands (Cassim, 2013; Dulencin, 2016). Typically, design-build tasks are defined in a team-based, learner-centered manner. Shifting from studio-based to real-based learning (Saxena & Arora, 2015) is now commonly used by architectural schools. Verderber et al. (2019) highlighted design-build as part of academic education through the notion of thinking while doing.

Canizaro (2012) asserted that design-build as a methodology has more to offer than just another approach to getting things done. He noted that because it is grounded in reality, it is a unique and complicated interdisciplinary activity that may increase students' abilities and pedagogy useful to other subjects. The design-build process, according to Chamel (2016), is not solely focused on abstract thinking, but rather on the mind's ability to learn and synthesize from the movements of the body: the hands discover, and the mind responds. He went on to say that this approach is more about confronting ideas with the reality of the fabrication process than it is about arranging them and that a creative manufacturing process would be feasible because of a dialogue between the ideas and materials worlds. Yang and Epstein (2005) note the fidelity of prototypes to be tied to realness. According to Deininger et al. (2017), novices frequently underutilize prototyping. Furthermore, the fact that the majority of design-build activities are either at the postgraduate level or in extra-curricular workshops (Khalifa & El Hefnawi, 2020) indicates that there is still a gap between design and construction at the undergraduate level. According to Yurtsever and Cakir (2012), multidisciplinary education is still on the agenda as a concept, and there are a few examples of it in practice.

The essay analyzes a design-build assignment process to study the highlighted problem due to an existing mismatch between thought and practice. The notion is that by going to the intersections of architecture and its neighboring fields and utilizing their shared roots in the design-build process, architecture studios will be able to avoid separating thought and practice. To get to the topic, we asked: Which adjacent fields are appropriate for use in design-build projects? Which characteristics of adjacent fields can keep thinking and practice connected? What is the procedure for trying this situation? What are the approach's prospects, restrictions, and implementations? Finally, what are the key components of the holistic approach? (Procedure and Elements)

2. Theoretical framework

2.1. Design-build by analogy

Gentner (1983) described analogy as "structure-mapping," which is the act of establishing relations that allow for the linkage of circumstances from one domain to another. It also takes inspiration from a deep integration of two or more areas. Designs are said to be similar if they share at least one function, behavior, or structure (Visser, 1996; Qian & Gero, 1996), which Hamraz et al. (2015) refer to as FBS linkage. Design by analogy is a tool for learning design thinking. This strategy can aid in the creation of numerous patented ideas from a single creative design, and the core of analogy-based design lies in the fact that comparable issues can be handled by similar solutions (Jia et al., 2018). According to the researchers, it is necessary to compare comparable features across two domains, fields, or objects to use them as a tool in

idea development. To design by analogy in architecture, a cross-field understanding of architecture and other areas or domains chosen to be negotiated in borders and overlaps is required. Analogical reasoning that is based on both academic literature and actual evidence is offered to architectural designers.

In design-build, when we are in the near-field or better yet, when we are in an overlapping field with architecture (OFWA), it appears that transference and modification may occur first with the shortest distance. The phrase "analogical distance," as defined by Chan et al. (2011), enters the ideation process from the same or very related issue area, and this notion is strengthened. However, they contended that by shifting designers into different industries through re-interpretation of design functions and characteristics, the transfer of solutions would be reduced, as would breadth and quality.

2.2. Finding OFWA prospects for design-build projects

Finding common ground is valid until disciplinary expertise is retained, as Li et al. (2015) addressed. Furthermore, Murphy (2016) suggested that accessing overlapping fields benefits architects not just in terms of practical application, but also as a synthesis of architectural knowledge and assessed disciplinary values such as cultural, social, and political ramifications. Furthermore, because architectonic is defined as a synthesis of architectural and other disciplines (Norina et al., 2019), the overlapping field should have architectonic logic. For example, identifying an OFWA candidate requires the fabrication notion related to FBS linking via analogy. According to the literature assessment, there are several ways to enter OFWA. For example, traditional techniques for investigating "nature and architecture" overlap (Portoghesi, 2000). As Gruber (2011, p. 50) emphasized, these techniques resulted in architectural implementations transferring and changing symbolic or structural natural forms. On one scale, nature is a broad umbrella that encompasses architecture, whereas natural elements are components of a subcategory that may be considered a neighboring domain on another. According to Dulencin (2016), architecture is linked to craftsmanship and art, and architectural detail, which signifies the way architects think, is born between arts and crafts.

Furthermore, to pick an appropriate OFWA, a prerequisite for becoming acquainted with material that matters as a key to responsible design (Solanki, 2018) is required. The use of different materials or the same material affects the tectonic. Product changes are conceivable if the tectonic plates shift. For example, in the pottery sector, the tectonics used to build anything out of clay are piping clay, utilizing a pottery wheel, or molding. When potters pipe the clay or use the pottery wheel, their products are barrel-shaped, but if they mold the appropriate corner, their product transforms into a cube box. While subjects, designers, needs, time, money, clients, and other aspects are vital, design-build solutions should include the characteristics of the material and the set that formed it. As an outcome, alternative construction approaches allow for the discovery of a suitable OFWA. As a response, while selecting an appropriate OFWA, prospective tectonics should be addressed with the selected material.

The setting, particularly the educational background, is the next requirement. Faculty, instructors, practitioners, and facilities are all part of the architecture schools. Furthermore, the location in which the school is located serves as a framework for learning. The manufactory spaces and accessible resources at Architecture School should be noted as infrastructure for performing design-build assignments. In the faculties, the disciplines as neighbors are effective. According to Chai (2020), the design-build studio pedagogy reflects the educators' multidisciplinary perspective, which is focused on human issues. It makes a difference whether a student is a senior or a junior. If the target group is freshmen, for example, there is a view of what they will contribute to architecture school, from non-school abilities to their architectural background. To summarize, a potential target neighbor field should be located near architecture

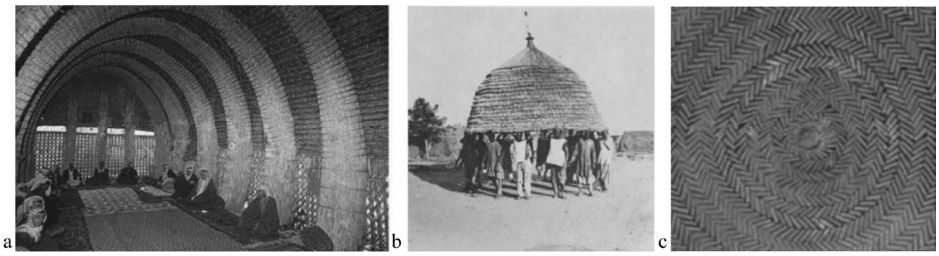


Figure 1. *The some examples of constructing and intertwining with a similar background a)A "Mozif" with an incorporated intertwined wall roof (Tani, 2015, p. 20), b)The basket roof is being transported to its location (Jacques Grillo, 1975), c) Bricklaying beneath the dome of a tomb in Khorasan, Iran (by authors).*

and share design beginnings, first in architectural logic, and later in the manufacturing concept connected with FBS linkage. All assessable resources that are embedded in the educational context should be taken into account.

2.3. Involving intertwining and architecture

Weaving is a mystical science and practical craft that dates back 12,000 years (Martin, 2005). At the form level, intertwining is defined as a method or action to form a fabric by interlacing threads through the process of combining wrap and weft components to make a woven structure grounded in the material affordances. Thomsen et al. (2016) investigated the ability of interweaving to be structurally flexible in the presence of several components that, when coupled and replaced with one another, allow for improved performance control. As a result, the interweaving process is not rigorous, allowing the weavers to exercise. Xing et al. (2011) provided clarification: Knots and links are well-known and require structures used to connect components in the production, such as woven baskets.

At the idea level, Griffen (2000) characterized the interweaving notion as an analogy of multiple systems such as textiles, beliefs, and values, all coexisting to mirror how humans understand and adapt to the natural world, such as the fragile web of climates, plants, animals, and species that rely on each other. To recall the manufacturing notion, the intertwining concept reflects a form of connection between components. The trait of architectonic subjectivity and its essence in creation organization are rethought at this level in the shared roots of architecture and interweaving. They have shared parallels from ancient times, based on the features of intertwining at both levels and via architectural evidence, particularly shelters, as empirical literature (Figure 1).

The participation suggests a similar foundation in the fabrication concept, as well as some form similarities. Both changed patterns to achieve unity as a whole that is greater than the sum of their parts. Several research projects have been conducted over the last two decades on the intersections of intertwining and architecture. Semper (1989) defined prehistoric shelter enclosures as being made up of wickerwork combinations of a carpet wall operating as a vertical source of protection. As a result, one of their shared backgrounds is their equivalent function. Tani (2015, p. 22) proposed that shelters include the most primal link: textile-human-architecture—a human feeling warm and safe within a textile-based form of architecture. He compared architects to weavers, claiming that both realize the need to see beyond superficial appearances when creating. Architects, too, recognize that good design is more than meets the eye. He continued, "Weavers recognize that the structure of the pattern, not merely the outward look of the fibers, determines the quality of fabric.

Rossi (2017) discovered that architecture has its roots in the process of interweaving. Intertwining is defined by Alexander (2004, pp. 456-458) as a system of consequential flows in which there is an overall order that connects components. According to the scholar, each architecture case contains intertwining-like features that provide a complicated look, allowing each component to be related to its surroundings. The phrases 'fabric, texture, and system' were used by Von Meiss (2011, p. 39) to

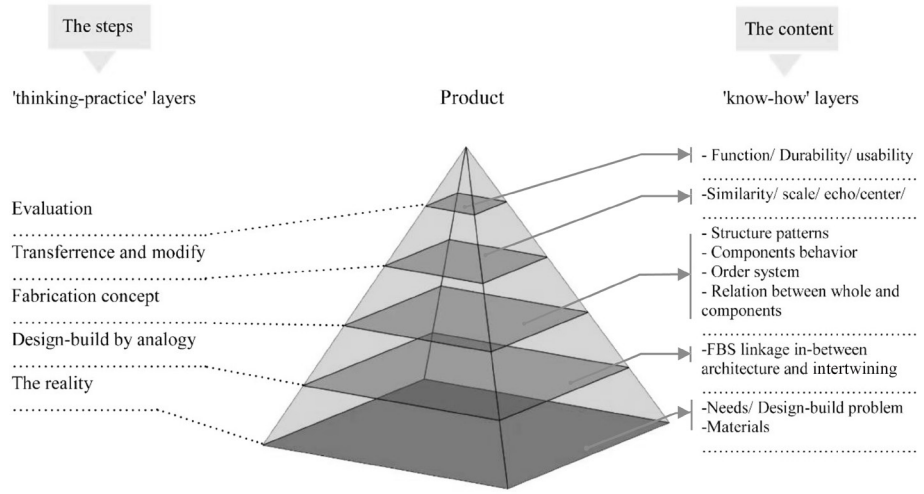


Figure 2. *A conceptual model for the process of making something in between architecture and intertwining.*

express the interwoven notions in architecture. He said that a fabric has a dramatic, communal, and simple, definitive order of structure that stresses similarities and scale, establishing uniformity while simultaneously allowing individual variances. Beyond interweaving's use in fabric design, Xing et al. (2011) suggest that integrating intertwining into creative architecture design enables a broad range of possibilities to generate surface patterns. There is a motivation for attempting to transfer intertwining strategies to architectural production, according to Ayres et al. (2018). Because it provides a set of principles to fabricate a wide range of complex, doubly-curved morphologies, including freeform and high genus, using only simple straight strips of material. In addition, architects have introduced intertwining as a fascinating alternative approach (Janssen, 1995).

In conclusion, architecture and interweaving are inextricably linked to the hierarchy of order that governs the pair of whole and components. The number of components is often restricted, and each one is significant and interconnected. Each component is weak on its own, but when coupled with others, it becomes powerful. The kinship of the components is amazing, and this greatly aids in their organization and alignment. In most fabrics, a series of chain reactions lead to the formation of the center. Their main focus is on the center, with the goal of achieving coherence. Furthermore, straddling is vital for creating grounded order and links between distinct elements of the whole. It is known that forces exist and move in each component of the fabric. Distances or pieces in duplicate structures such as fabrics or strings can progressively alter their shape, size, or orientation.

According to scholars' perspectives, intertwining a near-field with architecture has architectonic logic and is geared to fabrication notions. Furthermore, there is a structure tie between these two fields via analogies, as well as function and behavior correlations. As a basis of the paper's goal, interweaving is a feasible way to engage with architecture in a design-build project. It is possible to create a conceptual model for the process that occurs between architecture and interweaving (Figure 2).

The levels of the conceptual model on the left begin with reality and progress via design-build through analogy, fabrication concept, transference and modification, and assessment. They are merged in a back-and-forth motion to achieve the product on top of the model. Layers' nature blends thinking and practice, while architectonic support underpins each of them. On the right, the content that is grown from layers begins with needs and problem-solving, then moves on to searching for FBS links between architecture and intertwining, discovering structure patterns and order systems, attempting to develop the center, echo, and scale, and finally testing the product's utility. This content's order can change due to the

a b

Figure 3. *In the studio, an example of material affordability testing, a)The pliability of fresh and moist pomegranate sticks, b)The brittle quality of dry wood.*

dynamic nature of the layers. Content meets architectonic logic in the same way as layers do, and the method is carried out by know-how motion. This conceptual model will be used as a theoretical framework to guide us through the assignment's definition and execution. Field-study comments might be used to improve the model and create a clear instructional approach.

3. Methodology

The paper chose to conduct a qualitative study using action research as part of an educational experience project called "design-build of a light awning." For 24 Iranian freshmen, the "material and fabrication studio," a one-semester course at Yazd University's school of art and architecture in Iran's historic area, was held. The purpose of the workshop was to familiarize practitioners with material affordability through design-build tasks. The field-based studio encouraged group work to stimulate collaborative student interactions. The course was scheduled for one day (10 hours) per each week, with the final assignment making up seven of the sixteen sessions in the autumn semester of 2007/08. Two days of vacation were added between the two semesters to complete the assignment. Some pre-assignments were encountered throughout the first nine weeks of the semester. One of the authors was a teacher, while the other two looked at the assignment procedure. In brief, the method involves employing documentation, such as images, memoranda, collaborative observations, and experience feedback. The input was gathered over a period of thirteen years and over the course of the task. Secondary feedback from 14 readily available grads using a questionnaire was added.

Some attributes should be described in order to understand the context in which the assignment was completed. The school was essentially a bunch of restored homes in Yazd's historic district. From the faculty's standpoint, there was a preference for vernacular architecture. The presence of other disciplines like painting, restoration, and urban design, in addition to architecture, proved beneficial. The students were introduced to mats, cotton rope, wire, clay, and wood throughout the first seven sessions of the class. Collaborative problem solving was an indisputable feature of the studio. Earlier prototypes, according to Deininger et al. (2017), may have prompted students to reframe the job through deliberate contemplation of

Table 1. *Material abilities to cast shadows.*

Materials	Resistance		flexibility	Threat	accessibility	
	pressure	pull				structure
Wood	✓	✓	low	Weighty Special tools Time-consuming Costs	✓	✓
Fabric	×	✓	low	Short-life	✓	×
Reed	low	✓	low	Not assessable	×	low
Bamboo	✓	low	×	Not assessable	×	✓
Rope	low	✓	✓	To decay	✓	×
Wire	×	✓	✓	Corrosion Cost	✓	×

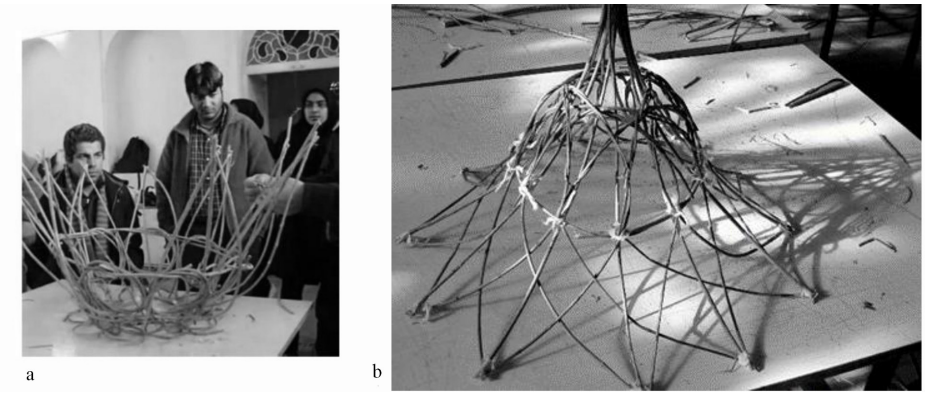
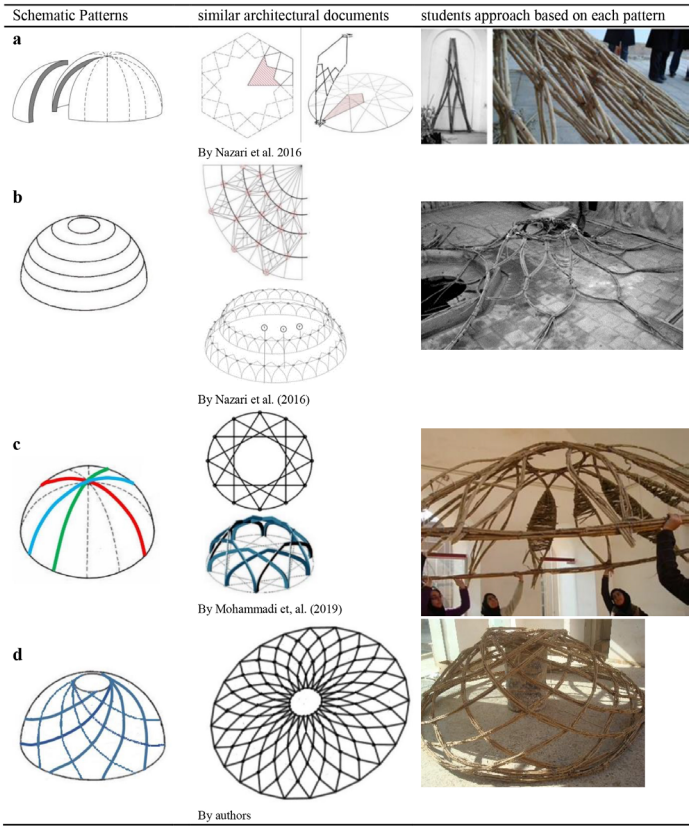


Figure 4. *Episodes from the studio, a)Trial and error via the fabrication, b)Example of student work from the warm-up step.*

what they had experienced.

To start the task, the educator defined the goal of the design-build challenge to create shade for one of the open areas in the participants' school. He also defined the time limit for replying. The area that each group was responsible for was a portion of the overall area. The students had a brainstorm via questions while touring the site to connect with the design-build problem. Students began with materials, according to the studio discussion. Wood, cloth, fabric, wire, bamboo, cannabis, and pipe were the suggested materials. Those options were feasible, but others were costly and time-consuming and required particular tools and abilities that the studio lacked. It questioned if we might choose trash to develop the alternatives. The participants had no notion at first, but after several group talks, some examples emerged. The educator returned from his break with two objects in his

Table 2. *Patterns of structures discovered, a)Repeatable track echo, b)Begin an orbit that expands to the pyramid and stratifies, c)Rotation of a module or comparable unit around a circle's circumference, d)Begin in the middle and work the way outward by duplicating an element.*



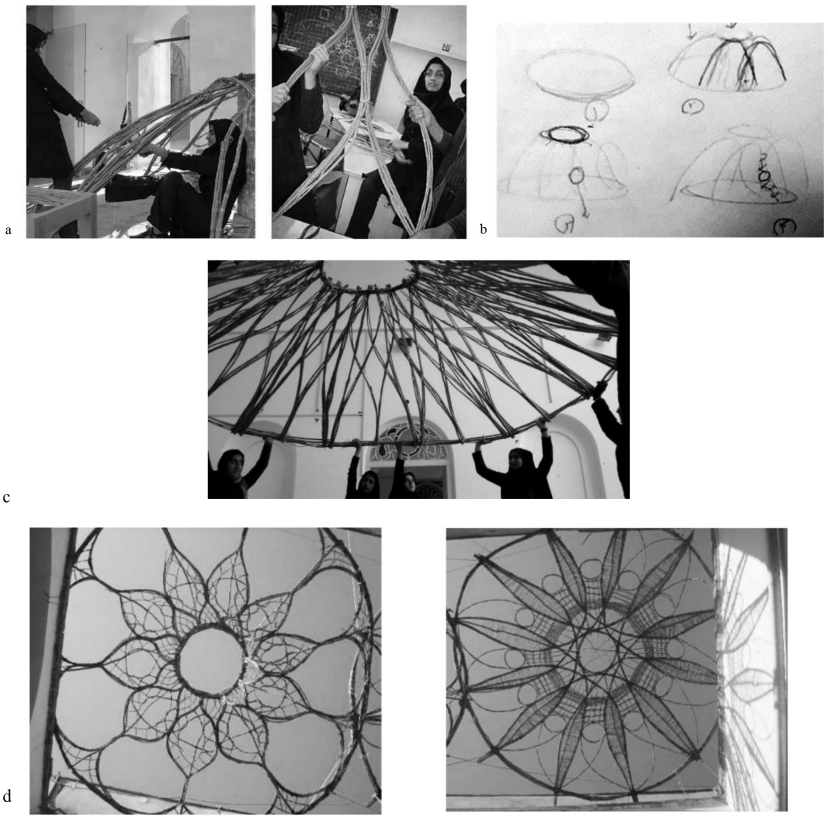


Figure 5. *Examples of images that narrate certain events from a lived experience, a) Interaction with the substance, b)Illustration example, c)The moment the student's hands raised the sunshades, d)Woven sunshades have been installed in their place.*

hands: fresh pomegranate sticks from the art playground tree and a waste dry wood piece (Figure 3). While the educator bent and pressed each wattle, the students observed the responses to the stress and identified the wattles' bendability.

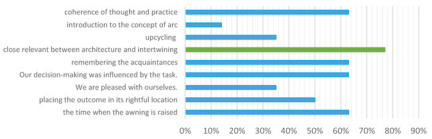
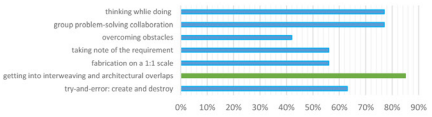
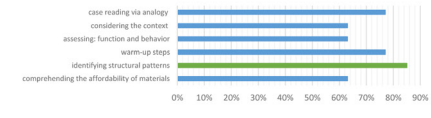
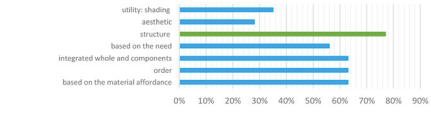
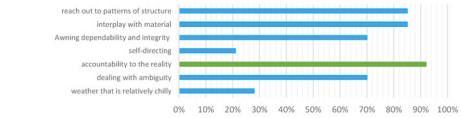
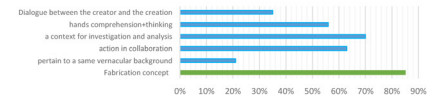
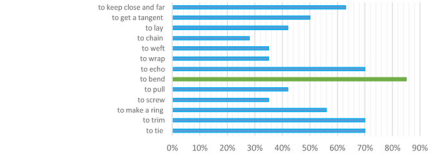
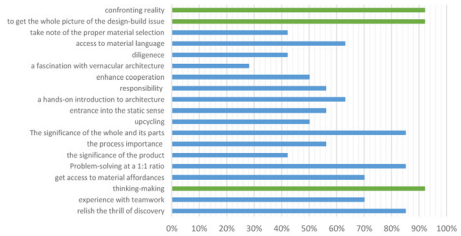
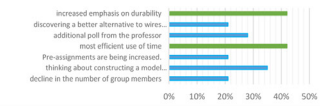
Following that, the pupils studied wattle, wire, willow, tin iron, and wood strap things. In addition, alternative assessable uses of similar materials were investigated through situations such as fish traps, cages, wire egg baskets, and wickerwork. Students attempted to decipher the instances. Through practical reading, questions were raised: what is the affordance of the material used in the cases? What if these examples might motivate us to discover a solution? Which material has the potential to provide shade? They interacted with the content and some cost-cutting strategies devised by the students (Table 1).

According to Table 1, wattle was the best choice for the primary material. To fill the gaps semi-natural rope and wire were chosen. The studio agreed to complete the task through close collaboration and trial and error. The students, whose families had a pomegranate orchard on Yazd's borders, then prepared some wattles during the pruning season. The participants divided wattles into groups based on length, thickness, flexibility, and hardness. The students were given a theme to design an arbitrary object called the pomegranate head fruit as a warm-up stage (Figure 4).

Following the development of the primer step's products, the studio was directed to find three-dimensional "weaving patterns" (Martin, 2007) that addressed structural patterns. During the process, four construction patterns (Table 2) were discovered that caused the students to bend and holistically bind the wattles to achieve the aim.

Based on the structural patterns, four groups were created. Using a one-to-one scale and an awning measure of 3.3 x 3.3 m2, four semi-open areas were identified as off-studio. The wattles were adjusted, and the extraneous teeth were clipped. Finding excellent

Table 3. *A collection of open-ended questionnaire quotes from graduates.*

rows	Category	Quotes in charts
1	Students' attitudes regarding the task	
2	The procedure	
3	The process	
4	The product	
5	Challenges	
6	Between architecture and intertwining	
7	Outstanding actions	
8	Advantages	
9	Disadvantages	
10	Suggestions	

and appropriate conjunctions, viewing anything as a mold to help interweaving, trial and error, failure and victory, make and break, collaborative problem-solving, facing blurriness, and indirect teaching from the teacher were some of the challenges. The students evaluated their work by monitoring the manual uploading, beating, and shaking. The studio discovered that some features known as rings were responsible for firming the awning horizontally and vertically, and some elements created stability. The students worked on their prototypes after the semester (Figure 5). Senior and other disciplinary students communicated with them and occasionally provided advice. Each group produced its response in the epilogue.

Human factors influenced the lived experience in the following ways: in-

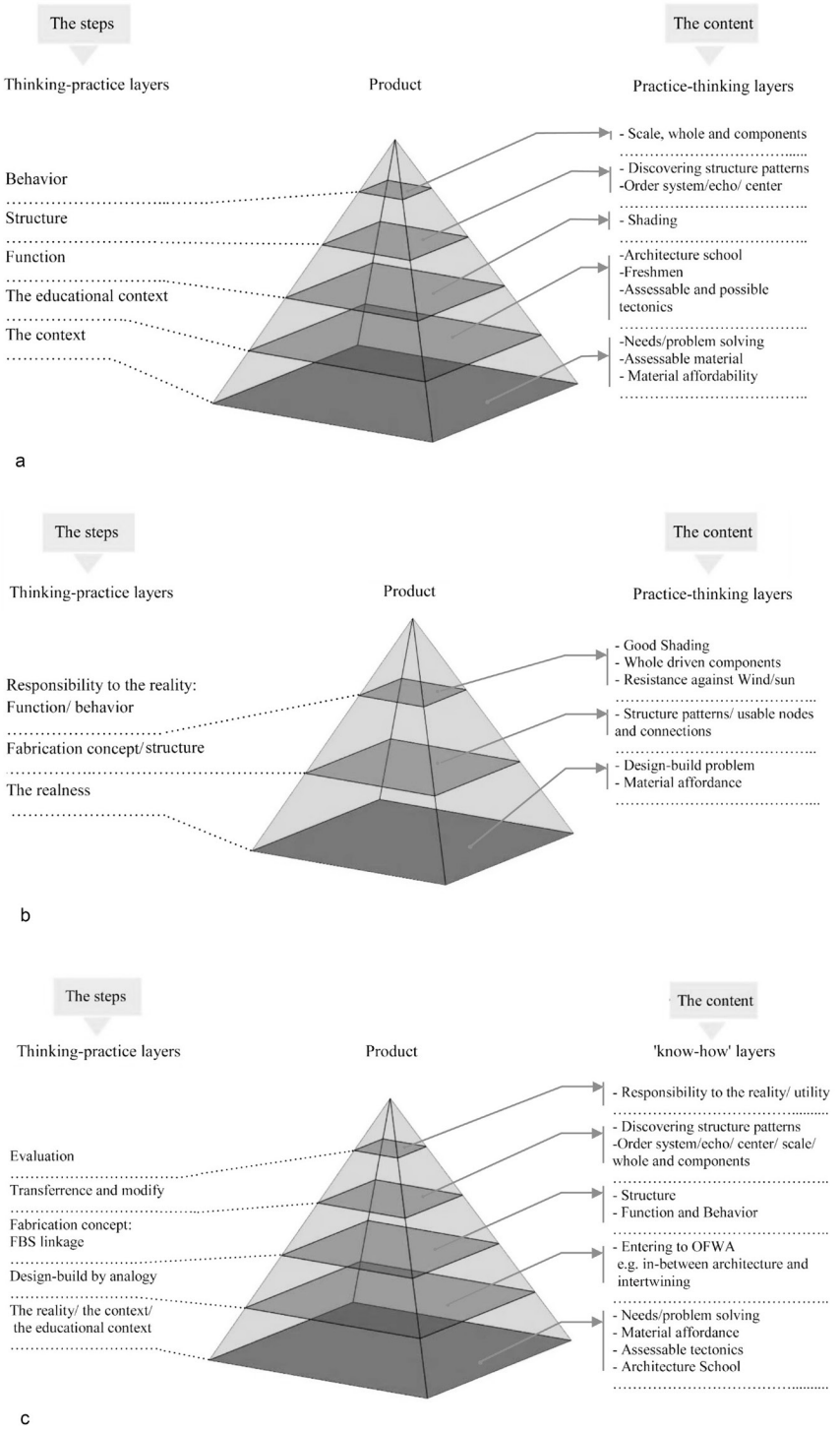


Figure 6. *Comparative analysis of outcomes: a) The lived experience process model b) The lived experience process model c) OFWA's proposed procedural model for the assignment.*

teractive community in the studio; students' inventiveness in generalizing, changing, and adapting identified patterns; the educator's role during the controlled trial and error; the possibility of revealing freshmen's non-school skills; and making a point of facilitating the students' affections to increase teamwork cohesion. The assignment time in the academic timetable served as a constraint. Another hurdle was working out throughout the winter. The commencement of the task coincided with the pruning season, which aided the studio in both economic and environmental terms. During the lived experience, students' awareness was expanded through multiple mediums

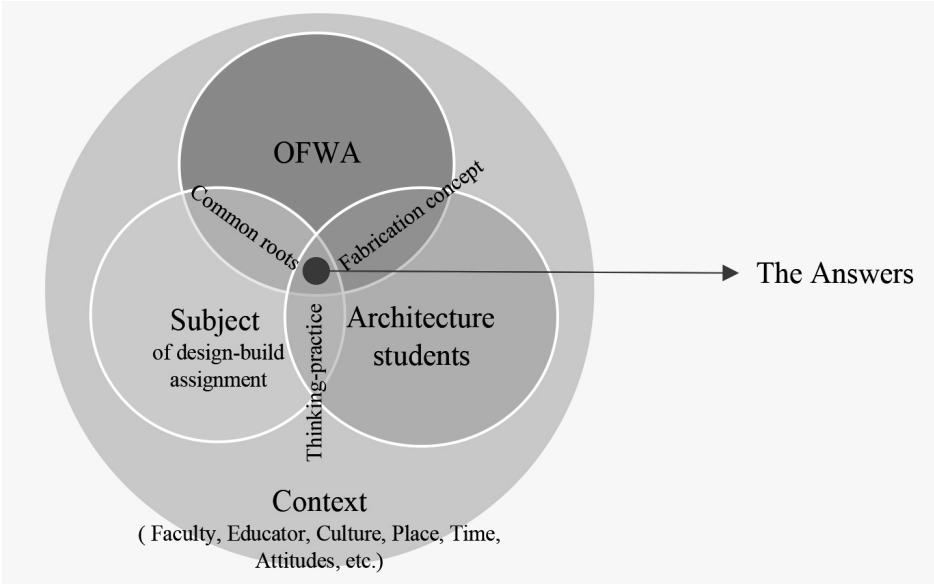


Figure 7. *The architectonic situation modelthe assignment.*

other than their eyes, such as their ears, hands, and hearts. For example, the students had trained their ears to listen for the wattle voice to determine the bending threshold.

The first data collection was based on the findings of our investigation. We chose to interact with the participants a second time to pursue this direction. Contact with all of them was impossible because 13 years had passed. A questionnaire with two closed-ended and 10 open-ended items was emailed to 19 assessable participants. They were given two weeks to react, and the authors got 14 responses. The open-ended questions referred to the following categories: 1) the students' mental image of the assignment; 2) the procedure, process, and product; 3) the challenges; 4) being in-between architecture and intertwining; 5) outstanding acts; 6) the assignment's advantages and disadvantages; and 7) suggestions. The closed-ended questions focused on the assignment topic and the student's approach to completing the project, alluding to the relationship between whole and components.

4. Results

The process occurred on the lived experience scale by emphasizing direct and indirect understanding affordance (Gibson, 1979; Norman, 1999) centered on material affordance, both as a limiting element and a source of inspiration. According to Chamel (2016), understanding the qualities of the material enables students to create practical tactics. Furthermore, in terms of structural patterns, the students discovered a vision for the remainder of the route. Dialogue with materials, material selection, finding tectonics, and responsive structural patterns were all linked steps that had an impact on the overall and component relevance. Controlled trial and error observation of the participants' abilities made it feasible to penetrate in-between interweaving and architecture. Furthermore, reading practical case studies aided the process of encountering one of the major opportunities in getting into interweaving and architecture. Case reading provides a setting to begin invention by analogy, which is acknowledged for its ability to stimulate creativity by Moreno et al. (2014). There was a mindset of providing a variety of solitary and unique linked instances to urge freshmen to not fix but to stimulate their thoughts (Sio et al., 2015). The criterion for the number of cases was to reach mental saturation in the studio.

The cases were not awnings; thus, the degree of copying was minimized. According to Ball et al. (2004), the pattern of analogizing ranges from case-driven to schema-driven, with novices exhibiting more case-driven patterns. The students performed case-driving while unconsciously straddling schema-driven

analogizing, which they accomplished by tacit knowing-behaving (Gourlay, 2002; Abel, 1981). Bending occurred as the result of wattle selection, which could be used to locate the active forms in naming the architectural patterns. Pattern discovery resembled what Martin (2015) saw about a basket maker's approach to structural morphology. As a result, ideation in design-build would realize as a form of the analogical design process (Goldschmidt, 2001; Casakin, 2004) consisting of identification, retrieval, mapping from examples to abstraction, and mapping from abstraction to new outcomes that overlap with the skill of stepping back (Kokotovich & Dorst, 2016).

On the secondary feedback scale, over 70% of the participants thought the issue was architecture and interweaving in the choice that stated building and intertwining the awning. The other three alternatives were to build the awning, intertwine the awning, and none. None of the participants chose the option "none". This finding demonstrates the approach's inter-field character. In response to the second open-ended question, 43% of participants investigated their pattern strategy from components to the whole, while 21% investigated the opposite direction. 36 percent explored combining two tactics, but none of them chose one of these three possibilities. As a result, all of the participants assess their work in terms of the relationship between whole and components, which is a feature of a holistic approach to their process and product arrangement. This outcome is consistent with what was seen throughout the field survey. Table 3 arranges the quotations in the same way that the questionnaire findings do.

Based on Table 3, the following results have been extracted as the most emphasized:

- In their vision of the task, they recall the intimate relationship between interweaving and architecture.
- During the method, it is possible to identify overlaps in interweaving and architecture.
- Detecting structural patterns is a critical step in the process.
- The structure of the awnings must be noted in the product.
- One of the most significant issues is accountability to reality.
-The features of interweaving and architecture are connected to the fabrication notion.
- As benefits, the following characteristics may be mentioned: confronting reality, learning by doing, and experiencing a panoramic view of design-build tasks.
- As a solution, some participants chose to develop a digital model before addressing the one-to-one scale. Furthermore, some of them defined the time constraint.
-Participants proposed comparable assignments, particularly for freshmen, as ideas. Participants also offer ideas to enhance time management and the number of colleagues in each group.

When secondary feedback is compared to the lived experience, it is clear that certain aspects vanished over time, while others remained in the thoughts of the participants while new features arose. There were some concerns regarding the result as fading characteristics, but today the grads are excited by the process of being between interweaving and architecture. As common characteristics, difficulties in being accountable to reality come first. Furthermore, being accountable for the structure is a trait shared by both groups of feedback. The comparison of the process via lived experience, progressive feedback, and the conceptual model results in the creation of a proposed model (Figure 6) that integrates the similarities and differences between field and library study.

Following the base layer that observes reality and context, design-build by analogy by entering an appropriate OFWA (e.g., between architecture and intertwining) would take place via the existence of at least one FBS linkage in the fabrication idea, according to the proposed process model. Then, by utilizing the connection qualities, transference and modification may be discovered. During the assessment stage, responsibility for reality in utility features may be developed. The stages recommended recall the architectonic situation, and the step content is based on integrated thinking-practice motion. Getting to the result as the students respond, the proposed model reflects a component of the architectonic situa-

tion (Figure 7).

The context-based architectonic situation is made up of three parts: 1) architecture students, 2) the assignment subject, and 3) the usage of an OFWA. It enables students to discuss their varied strengths and areas of competence. As a result, student participation and creativity, as well as teachers' attitudes and guidance, are critical to its dynamic student-focused feature. When presented with the implementation of an OFWA, the engagement of students and the issue is also highly active. The existence of an OFWA catalyzes innovation. In a broad view, the role of the triple components core is critical to ordered understanding and the ability to engage in thinking-practice interaction centered on the manufacturing notion. This situation provides an immediate and significant opportunity based on the obligation to the reality of problem-solving during tasks. Because of this open-ended situation, we can avoid dividing design and construction. It can help with material affordance analysis, material and tectonic selection, and pattern discovery. Furthermore, in the conclusion of this case based on FBS linkage, the integration of structure, function, and behavior is exclusive. The situation steers the studio's approach toward an organized solution that is coherent in both its whole and its components. The responses result from a comprehensive approach to transferring and altering the architectonic character of new creations linked to the origins, while we may change many related responses based on common roots.

5. Discussion

The paper stated that using an OFWA based on the architectonic situation can bridge the gap for freshmen due to the mismatch between thought and practice. Since the ancient Greeks employed the term "poetics" to refer to the study of producing things, the problem connects with poetics in its roots (Schon, 1984). Based on this, Depew (2010, p.52) validated the attribute of being subject-free to architectonic generating art. On the other hand, this situation collides with reality, bringing with it a slew of challenges and demands, as well as the prospect of coming into direct contact with the design-build conflict. Because students' problem-solving processes are influenced by their experiences in the first semester of their freshman curriculum (Mullins et al., 1999), it is critical to introduce them to a volume zero of an architectonic situation. This version is based on a few practical-theoretical aspects of creativity in neighboring fields that have been generalized in architectural education. The article supports Schon's (1984) conclusion on the marriage of creativity and practical science in architectural studios. He stated that there are no clear borders between design-like processes, and that learning transfer between them is neither straightforward nor inevitable. Nonetheless, the incentive that might entice educators to follow this situation refers to an attitude toward architecture education that sheds a completely different light on the role of the arts and architecture in the architectonic situation. The situation allows for an examination of the FBS relationship, which has tied the process to analogies. The linkage of structure between architecture and intertwining is quite strong, which might enhance students' static understanding culturally and indirectly.

It is one of the approach's educational accomplishments that it can address students not to compel the material to behave in a predetermined manner, but to allow it to respond as its nature needs. According to McAdam et al. (2007), the concept of tacit knowledge can help in the dichotomies within the expanding grasp of the issue and can be formed in organizations at both the group and individual levels. This feature is related to the character of the architectonic situation. Following that, at future stages focused on the individual and group, the concept of tacit understanding is vital in performing such tasks utilizing the approach. The educational context in which this approach could be used is dependent on contextual learning strategies (Sahin, 2019). Divergent learning in education is more in line with this approach. The assignment subject definition and being site-based, particularly at historic sites, are fundamental. As

stated by Baron et al. (2020), historic sites prompt historical thinking and analysis. The presence of linked cases directs studios to the genuineness of the situation. Case reading is modified into practical case reading as a distinct practice in architectural education (Atman et al., 1999).

The experience reinforces Schön's (1984) point about the necessity of the educator's role as a studio master who serves as a coach and demonstrates, advises, questions, and critiques rather than as a teacher. He stated that students collaborate with other students, who occasionally serve as coaches. According to the field study, the senior support was beneficial. Cooperation among students from various backgrounds in each group is a strength that contributes to their mutual understanding across disciplines. This aspect is consistent with findings made by Latka and Michalek (2021) using interdisciplinary approaches in architecture education. According to the feedback of the participants, there is a strong desire to do tasks like this. According to Russel et al. (2018), students' interest in such projects stems from the desire to "get out of the classroom" or "have greater flexibility to work independently," and a significant component that appears to draw students is the opportunity to engage in genuine projects. The report validates this, especially when it comes to meeting reality. Some factors should be examined while deciding on the ideal educational year to complete such activities. According to the comments, the majority of participants suggest similar projects to first-year students. Fourth-year students are expected to perform the job in the discipline based on the static information they have obtained. As a result, the approach's efficiency will be lowered slightly. Based on the remarks and the nature of the situation, as well as how Besterfield et al. (1997) addressed the issue of setting realistic retention objectives for freshmen, we recommend that the target group be first-year architecture students.

Another piece of feedback that relates to offering such assignments for freshmen is that some participants favored digital modeling over one-to-one scaling. According to Yang and Epstein (2005), modeling is used to evaluate ideas, reduce design risk, and prove processes, materials, tools, and components before making them a reality. So, if we can think-practice on a real-world scale, it appears that we must acknowledge a one-to-one scale in prototyping. If the students are in their fourth year, they can model, but as freshmen, they are inexperienced in this capacity. Given the facts expressed regarding the need for encountering on a one-to-one scale to avoid mismatching design and construction, and using the approach for freshmen, it can be concluded that digital modeling would not play an essential role in this situation.

The size of the products is significant in this approach. The essay contradicts Clouse's (2014, p. 466) recommendation to commit time, resources, and energy to micro-design-build projects. Being open-ended, which is linked to the ambiguity of the product, is the nature of the situation and might ensure the need to produce. Furthermore, it directs the de-mystification of the design-build problem (Lawson, 2005). Other properties are confronted with the reality that causes the process to anchor in the setting, particularly in assessable materials with their associated tectonics. This approach belongs to the framework of culture-oriented education, which is in line with Rodgers and Bremner's notion of confining the "here-and-now" (2019, p.9). As a result, the situation isn't context-free. In this case, the OFWA role can also be used as a supplementary context. The presence of this ingredient improves product affinity. It is preferable to adopt such measures in more time, yet academic semester time limits are unavoidable. The procedure should be flexible that an overlapping move to another related topic is conceivable if necessary. Since the proposed model's layer relates to both the selected OFWA and the assignment subject, it should be altered too.

6. Conclusion

The current study recommends architecture instructors use OFWA in design-build tasks. This is a chance to acquaint students, particularly freshmen, with a holistic view of the

architectural decision-making position without mismatching design and build. This paper seeks to retrieve that integration in architecture schools and names the approach to the architectonic situation as it was in the origins. Despite the constraints of schooling viewpoints, the approach is to broaden the scope of architecture. It is to reconsider an integrated knowledge base through analogies linked to FBS linkage in the fabrication notion. This necessitates the educational context's affordability as a necessary acceptor that takes into account cultural, environmental, economic, historical, and human aspects. The proposal of addressing reality should be included in this approach at multiple levels, including the educational context, educators' viewpoints, and practitioners' attitudes. Thinking-behaving is involved with us in this approach, while our hands comprehend. Using this approach will result in one-to-one basic, sensible, but stimulating replies. The approach and the situation highlighted by it are a fruitful linkage in the assignment scale, with benefits on three levels:

a) In the process: integration of thought and practice based on shared origins

b) In the product: coherence of components and the whole as a result of the organization

c) Approach to a holistic view of creating based on architectonic principles in studio pedagogy

There are two levels of advantages obtained in the architectural education scale:

1) Approach to an operational concept for an architectural problem in first-year studios

2) A return to the origins of design in Architecture School

The approach central to this research is the discovery of structural patterns through analogies. The role of the linkage may range from one candidate field to the next. Future studies should look at this. Despite having had multiple such instances, we did not properly investigate all of the effective variables. Some further generalization characteristics should be included in the specification of the approach as a strategy for future development. For example, additional fresh experiences must be recreated by utilizing other appropriate OFWA through various assignment subjects, resources, and students. As a result, the situation's three aspects could be scrutinized more closely. Other activities such as tapping, stitching, hammering, melting, softening, scraping, polishing, and excavating should also arise as a result of diverse tectonics. It must also be experienced in various educational contexts to uncover additional beneficial variables. In terms of process length, a faster arrangement of preliminary steps is required in future encounters.

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