

## **Introducing Creative Space: Architectural Design Studio for Architecture Students; Challenges and Aspirations**

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**A****bstract:** The architectural design educational process is one of the most challenging and creative ones especially when dealing with sophomore students. The challenge in this case is relatively high amid the urge to deliver functional knowledge, spatial recognition as well as help the students explore what real meaning of architecture and creative spaces they are ready to embrace. The main challenge is how to deliver several issues related to creativity, form generation, design development as well as basics of structure and standards of functional use. This has to be implemented and delivered to the architecture students in a totalitarian and comprehensive method, in addition to leaving adequate space for each and every student to experiment and add his own values and backgrounds to the design process. Thus, the paper aims to explore and discuss an experimental design studio introduced in two consecutive studios tailored for sophomore architectural students based on a case study implemented by the author. The paper aims to introduce a method for introducing the design process to students through an inside out process which helps the students start their design education in a method which encourages creativity side by side with applying the basic standards. In order to explore this in a comprehensive approach, the paper will thoroughly discuss the process applied in both design studios, and analyze the process and development of six selected students work from both groups, with special analysis of the creativity of the selected material, the qualities of space and the reaction to context and function. This will be re-addressed in the shadows of a brief literature review of the introduction of architectural education to students. The paper concludes with a set of recommendations useful for designers and educators for improving the quality and process of architectural design education.

**Keywords:** creative space, architecture education, prefabricated materials, design process, architectural thinking

### **Introduction:**

The architectural design educational process is one of the most challenging and creative ones especially when dealing with sophomore students. The challenge in this case is relatively high amid the urge to deliver functional knowledge, spatial recognition as well as help the students explore what real meaning of architecture and creative spaces they are ready to embrace. The main challenge is how to deliver several issues related to creativity, form generation, design development as well as basics of structure and standards of functional use. This has to be implemented and delivered to the architecture students in a totalitarian and comprehensive method, in addition to leaving adequate space for each and every student to experiment and add his own values and backgrounds to the design process. Thus, the paper aims to explore and discuss an experiment introduced in two consecutive design studios tailored for sophomore architectural students based on a case study implemented by the author.

The experiment addressed the issue of creating a new addition in campus, which acts as a temporary pavilion for a prefabrication industry. Six cases from each group were selected for analysis according to the

outcomes of the literature review. The limitations of the study will be highlighted below before addressing the analytical part. This experiment is useful for educators and designers to shed light upon one of the possible approaches in addressing architecture design for beginner students.

### **Literature Review: The Nature of The Design Studio:**

The main aim of the literature review in this paper is to shed light upon the different approaches adopted in introducing design to architectural students. The nature of the design studio differs from one school of architecture to another. Thus, it is important to review the totalitarian aims of different studios before addressing the experimental design studio which is the focus of this paper.

As to Salama [1], addressing a design studio strategy has to be viewed from a totalitarian perspective stemming from the global context of the university mission. He advocates that a university should foster a campus environment that nurtures exploration, enlightenment and critical thinking among all students. The main aim of undergraduate education is to foster inquiry, investigation, and discovery. This is crucially important to observe and inter-relate with the mission of the design studio in order to improve the quality of architecture education.

Salama [1] further asserts that architectural education, as one of the distinctive branches of education, requires the development of creative capabilities. The primary concern of architects is to produce three dimensional space and form to accommodate related human activities. Like other types of education, architectural education conveys, conserves, and transmits the values of the profession and society at large. Since humane environments are created in a field of tension between reason, emotion and intuition, architectural pedagogy should be viewed as training toward the manifestation of the ability to conceptualize, coordinate, and execute the idea of building rooted in humane tradition.

Stemming from the previous debate, it is useful to review some of the quotes highlighted by pioneer architects related to design philosophy and pedagogy. Mies van der Rohe stated that “true education is concerned not only with practical goals but also with values. Our aims assure us of our material life, our values make possible our spiritual life.” Walter Gropius asserts that “the Bauhaus fights imitation, inferior craftsmanship and artistic dilettantism”. Frank Lloyd Wright assumed that “you can't make an architect. But you can open the doors and windows toward the light as you see it”, while according to Norman Foster “The pencil and computer are, if left to their own devices, equally dumb and only as good as the person driving them”. Thus, the value of the design problem has to be critically selected by the professor in order to provide a critical and valuable design experience especially for young students.

The strategies adopted by various architecture schools, with special reference to the Egyptian context limit the students to embrace a predominantly artistic paradigm that emphasizes personal feelings, intuition, imagination, and subjective judgments at the expense of other paradigms capable of fostering the creation of humane environments. No matter which contemporary movements are claimed under the roof of the studio, the setting of the design problem is de-saturated from the knowledge base as well as the community reference base. Similar to what Salama [1] mentioned, education has been decomposed into schools, curricula, grades, subjects, courses, lectures, lessons, and exercises. In this respect, one can argue that formal education has never been treated as a whole, nor is it appropriately conceptualized as part of a process much of which takes place within society; a characteristic of the systemic paradigm.

Historically, the design studio ran in The Ecole des Beaux-Arts like a confederation of Ateliers. Each atelier had its distinct character through the leadership of a patron, usually an accomplished architect. Students joined the atelier where they are trained toward the entrance competition that consisted of three

parts. The first two parts represented sketch problems, “Esquisse.” In the first part candidates were asked to design a simple architectural structure using classical motifs. In the second, candidates were asked to produce a large-scale accurate drawing of a decorative architectural element such as a capital of column, [1]. The third part of the competition was a comprehensive written test that examined the scientific knowledge of the candidate.

While in the Bauhaus, proof of adequate previous education was a determining admission factor to be complemented by a “Portfolio” for those who wish to be admitted as to Krähling et al. [2]. Candidates with more experience could apply as junior masters. In this case, they were required to submit certificates of previously completed training in the crafts.

According to Krähling et al. [2] education of architects in the Budapest University of Technology and Economics initially emphasized the copying and surveying of buildings which gradually developed through specialized design tasks to the creation of new values. By charting and analyzing the remained stock of historical drawings, sample books and photos in the period from the mid 19th till the mid 20<sup>th</sup> century, as well as assessing former publications and databases, this project hopes to give an overview of the role and importance of drawings in the history of architectural education.

This strategy for new students is verified by the claim of Krähling et al. [2] that plan drawing has been from the age of Early Modern the main means of expression of architectural thinking, and consequently the most important medium of modern architectural education. This thesis has been formulated by Leon Battista Alberti, the most important theorist of the Quattrocento. This is further advocated that one of the main aims of architectural education has always been to teach students to express their ideas in drawings. It is the summary of knowledge of the architect gained in arts, technical science and the humanities during his education. The research of architectural drawings has major international research literature. The first known drawings collections and the beginnings of architectural survey, as contributions to the design, can be dated back also to the Age of the Renaissance, Krähling et al. [2].

As Özer et al. [3] imply architectural design education forms a unity with architectural design studio courses and theoretical courses supporting them. Core design studio is the fundamental course for initiating the process in the first year of education. The main purpose of fundamental design studio course is to teach “the language of design” by introducing students to 2D and 3D tools of thinking in order to produce high quality spaces. The second objective is the basic architectural problem: to introduce spatial concepts.

Furthermore, the architectural design studio, which is defined by Koester [4] as a “studying space for a talented person,” involves a doing-undoing, an experiencing space for channeling creativity into architectural design education. Koester [4] defines the active learning space of a studio as an inspiring and creative experience that is also adored by students. While Schon [5] has pointed out that novice designers are not fully experienced in problem solving skills. He explains that the reasons are the discrepancies between thought and actions. Schon [5] notifies the “reflection in action” theory, pointing out that basic design knowledge can only be obtained by “doing.” Therefore all theoretical information should be integrated into design studio by doing, undoing, and experiencing.

In addition to the above critique by scholars, the following review of some of the renounced international schools of architecture is presented to highlight the relevance of the strategy used in the design studio with the global level of architecture education. The mission statement of the Faculty of Engineering, School of Architecture in McGill University is to “advance professional architectural education which flourishes through research, critical practice and community engagement”. While the in the University of Oregon, College of Design, the mission statement is to support “advancing the understanding, value, and quality of visual culture and the built, natural, and social environments through excellent and distinctive teaching, research, and creative endeavors” and also to “enhance the lives of individuals and communities

through endeavors that stem from intellectual curiosity, critical thinking, and broad inquiry, rooted in the inter-relatedness of theory, history, and practice”. And as to Stanford University, School of Architecture, “Architecture is concerned with improving and explaining environments by revealing meaning in location, function and structure — enriching and heightening experiences, and, ultimately, improving lives”.

Finally, based on the previous literature review it can be observed that as shown in figure (1), the combination of study scopes related to architecture education is complex and comprehensive. It is important to acquire knowledge, skills and create an outcome which corresponds to the needs of the community, the advances of the era, the needs of the users as well as spaces which add an aesthetical value to the context. This has to be also introduced to the architecture student in a way which engages creativity. Based on this, the next part will present the case study description and limitations and how this experimental design studio helped nourish the required knowledge and skills for architecture students.

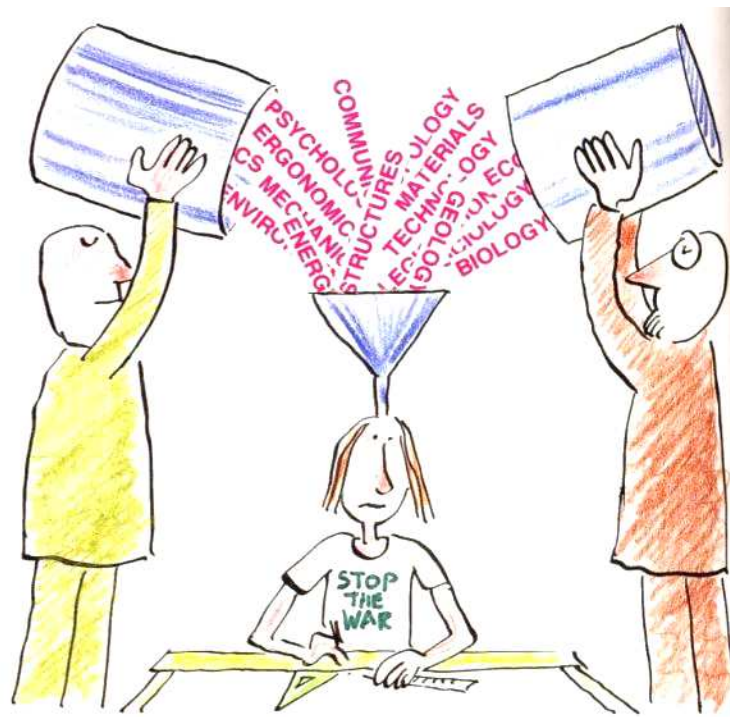


Fig. 1: Various Input given to Architecture Student by the professors, Architecture A-Z, Hellman [6]

### Case Studies Description and Limitations:

As Frederick [7] explains, “being process-oriented, not product driven, is the most important and difficult skill for a designer to develop”. He also implies that it is an important fact that one of the initial and important skill which has to be delivered to young architects is to design with models. It has to be pinpointed that this research is conducted consequent to another experimental design strategy implemented by the author [8], which covered the detailed sequence of design tailored education for the first year architecture students as a whole. Whereas in this paper, the aim is to deeply analyze the method adopted in the primary design problem introduced to the first year students, which was conducted on two groups of students from which a sample was selected from each.

The initial educational process was to produce site investigations on the plot which the students experience on a daily basis to introduce the basics of site analysis and how to respond to the context. Following that, the main design problem was to select an adequate material which resembles the prefabrication industry to create the new addition to space. This has to be a simple unit which via repetition and rhythm creates the shaded and semi shaded addition to space. Based on that, the issue of creativity was

tackled through encouraging the students to respond to the material by the most creative way possible. The paper will address the response of both groups of students to the simple design problem in a comparative analytical method which will be discussed thoroughly in the analysis criteria.

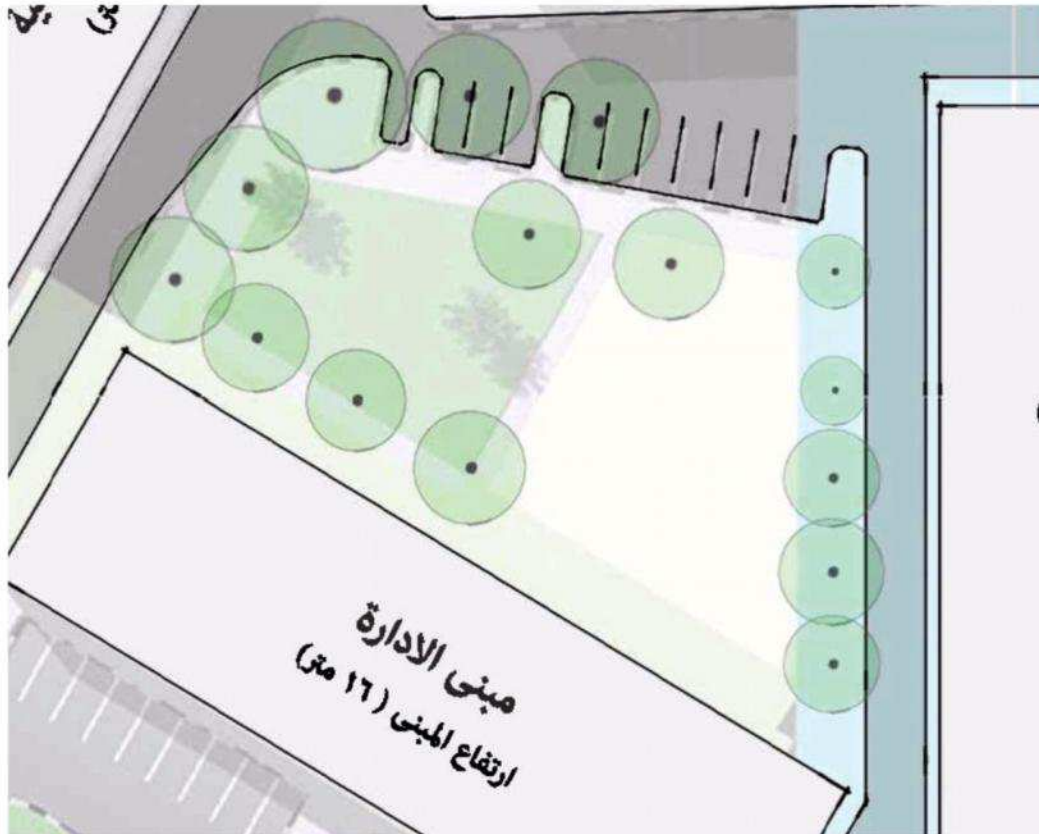
The project outline introduced to both group of students was to design a “Pre-fabrication Industry Expo in the Faculty of Engineering Campus”. The project represents a compilation of all studied topics related to design procedures, skills of displaying ideas, form generation, architectural drawings co-ordination and pre-design operations in a project which aims to produce a 3-dimensional expo in the CUFE.

The expo has the function of displaying the different sized products of a pre-fabrication company which targets engineers and architects to have an overview of the industry. However, the main challenge of the project is to reflect via materials and structure the nature of the industry to be displayed, as well as create an eye-catching and attractive display mode to attract as many visitors as possible to experience the expo. Thus, the whole of the expo shed as well as boundaries are decided to be built of a symbolic unit of the prefabrication industry displaying its products.

The project is located in the garden area behind the administration building of the Faculty of Engineering in Cairo University (figure 2, figure 3). The site is selected in the area which represents an important hub and social integration plot in the campus, where students from different departments can meet during break time. The site also has an important ecological feature, which is the presence of several old trees which mark layers of history of the campus. Thus, the challenge of the project is to integrate within the patterns of use of the users of the garden, dwell with the existing valuable landscape, represent environmental sensitivity as well as fulfill the required image of the 3-dimensional expo required by the prefabrication company.



Landplot of the Design Project, Google Earth, 2016.



Actual Land plot given to the students for implementing the Design, Author, 2016.

Given the previous description of the design problem, the criteria of evaluation is as follows

- Successfully merging solids and voids in the composition.
- Sustainable and Ecological Inclusion.
- Structure adequate to the Prefabrication industry.
- Leveling in shed and in the horizontal plateau beneath to produce attractive display areas and seating places.

Following that, the students were introduced to qualities of space through a series of studio experimentations addressing the issues of internal space experience, dominant and sub-dominant qualities of form, positive and negative space, form response to context, form adequacy to various activities it beholds. In the final stages of the design process, the students were asked to draw the outcome of their physical models in the boundaries of the context, and to inter-relate the applied design in coordination with the previously implemented site investigations. In addition to that, they were asked to add scaled down figures of humans to fit in the use of internal spaces created as a method of primary introduction to standards of use. The two groups of students were subjected to the same time frame; same tutors and they both had the same background of previous education. The next part will present the outcomes of the experimental design studio in a comparative analysis based on the following points extracted from both the literature review as well the professional experience conducted by the author relevant to the intended learning outcomes necessary for students in the first year architecture year;

1. Choice of creative material.
2. Ability to attain a 3d composition with successful merge of positive and negative spaces.
3. Dominant, sub-dominant and subordinate use of masses.
4. Adequate leveling.
5. Spatial experience adequate to the function.
6. Spatial experience adequate to site analysis.

7. Successful drawing of plan and section.

### Comparative Analysis of the Outcomes of Both Experimental Groups

As shown in table below, (table 1), the first group of students used various materials, matchboxes, cut plastic cups, straws, ping pong balls, eggs cartoons and newspapers coiled into tires forms. Students were encouraged to use different readymade elements or units which by different settings provide an experimental translation to the prefabrication industry. Students were encouraged to think out of the box and avoid any conventional materials used in architectural models. This selection helped the students to formulate a different approach for a possible new technology and building techniques presented by a modular repetitive unit.

**Table 1, Group 1 students work, Author, 2016**



Students were then encouraged to use the units positively and negatively by addition and subtraction methods of design to build up spaces with a scale of 1:50 of the expo in the site in campus. This aided the students to visualize the needs of the users of the space, which pathways they need to go through without interfering with the function of the expo. In addition to this, they were encouraged to think of how to create

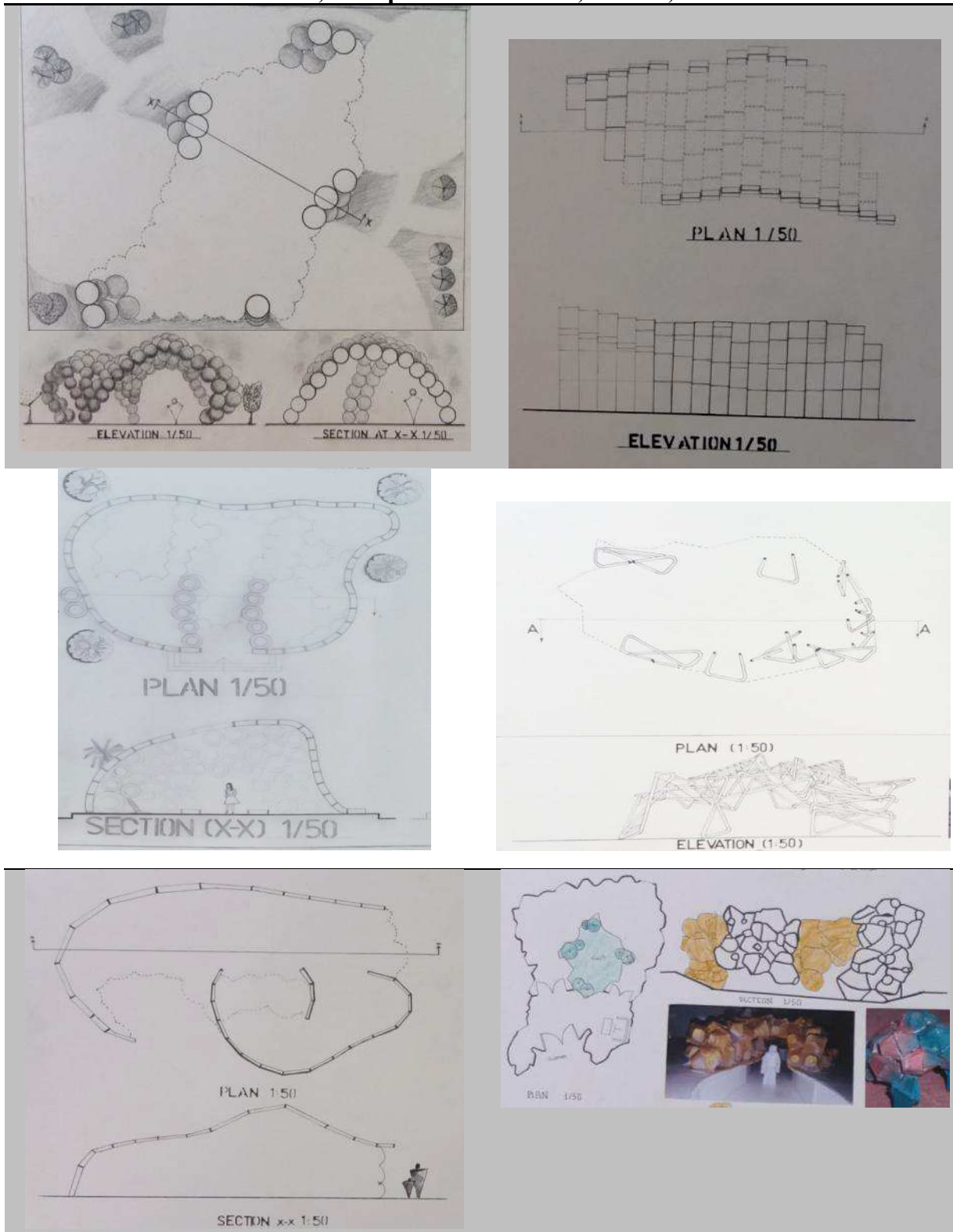
a quality space inside by providing opening in the shed. Moreover, to analyze which technique of construction is adequate to selected unit, whether it can be reversed into waffle shell structures or shell structures or long span frames as shown in table 2.

**Table 2, Group 1 students work, Author, 2016**



After a period of 4 weeks, in which the students developed their ideas by a weekly experimental model experimenting its adequacy to functional, ecological and ascetical qualities, they were asked to draw the projections of their models on the given land plot, as a plan showing the planes cut as shown in table 3. In addition to that, a selected section was drawn from their expo projects in order to further develop their projection skills and learn further the essences of the interior spaces they developed by their models design, (table 3).

**Table 3, Group 1 students work, Author, 2016**



The second group of students was given the same design problem in the semester following the first group, (table 4). They were asked to develop new materials and think in an even more creative method to

integrate the assumed pre-fabrication industry into a 3dimensional form to create the expo space. And as shown in the images below, they used macaroni particles, plastic spoons, paper origami forms, ice-cream sticks, wooden coils and matches to create their spaces.

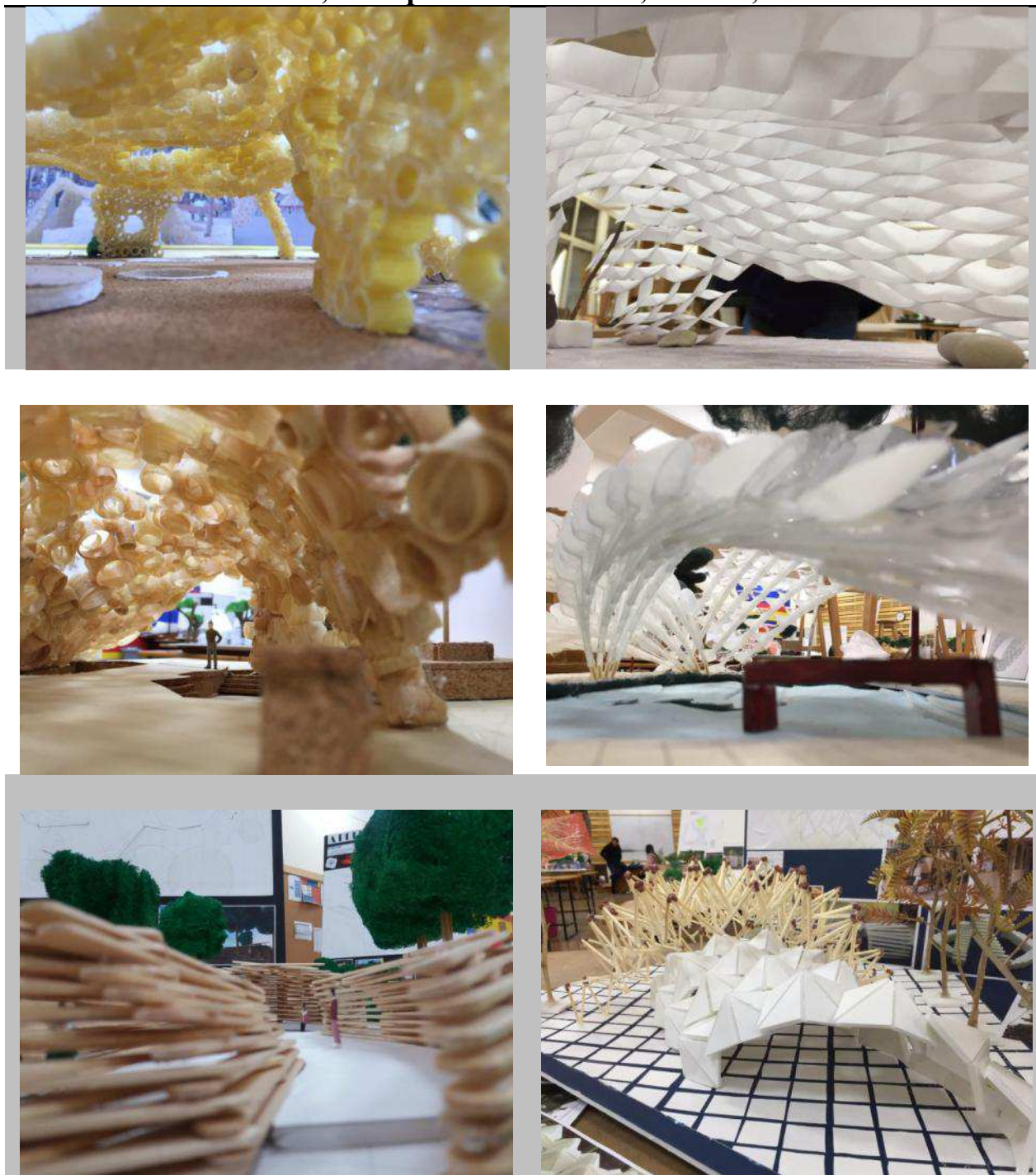
**Table 4, Group 2 students work, Author, 2017**



For this group of students, as shown in table 5, the use of the pre-fabricated unit was better directed to produce dynamic spaces, which respond to the nature of the function inside in addition to creating

appreciated qualities of space. The students were encouraged to work more with experimenting via weekly study models the solid and void allocation of the prefabricated unit. They were also guided to experiment on campus the motion of the students around the assumed expo space and create simulations and photomontages to the new addition in campus. For this group also, the tutor presented a brief introduction to the use of parametric design in the creation of the shaded space to respond to basic environmental needs which added a very good addition to the students design.

**Table 5, Group 2 students work, Author, 2017**



Finally, as shown in table 6, the students were asked to produce the illustrations of their physical model in a training approach to the basic projection exercise they covered in previous semester. They were asked to also work on the design of the plateau on which the exp was placed to provide a better and comprehensive design than group one. The duration given to the illustration part in this group was two weeks longer than the previous group.

**Table 6, Group 2 students work, Author, 2017**



## Discussion

This paper aimed to present two case studies implemented by the author for first year architecture students in a design studio which aimed to experiment an approach of introducing basic architectural knowledge and skills as well as develop and enhance students' creativity and develop the architectural way of thinking. As explained in the analysis, the two groups were tutored on consecutive semesters, which gave a good opportunity for the tutor to develop further the way of introducing the knowledge and skills and gain better experience in delivering the design problem. It was noticed that in the second experimental design studio for group two, the students showed more creativity in the choice of the unit for the prefabrication industry. Also, the setting and qualities of the form were better responsive to the needs of the expo and the context. The motion of the students around the designed addition was thoroughly experimented in the second group to avoid merely judging the output of the design in a formalistic approach.

From both studios experience it can be concluded that accumulative experience and experimentation is an important asset in design education especially for first year students. The selection of the design problem itself is important as it provides the needed issues to be tackled, and for the first student's experience it has to be simple yet comprehensive to avoid misleading the students into mere functional or mere formalistic approaches.

Finally, the experimental design approach for first year studio is still an ongoing research and educational attempt to further nourish the education and pedagogy approaches for first year architectural students. More documentation and explanation of the complete process will be discussed in further researches.

## Conclusion

The paper presented a brief literature review related to the various approaches and missions of architectural education with special reference to first year architectural students. Following that, the analysis of two groups of architectural students work was explained and analytically compared based on a unified design problem made by the author. The paper concludes with the importance of evaluating the comprehensive design educational process relevant to each specific culture, community and architectural school in order to provide a comprehensive design approach not limited to a functional or formalistic model which lacks the needs of development of the students in their educational process. Most importantly the educational process needs to be interrelated to the life and work experiences the architectural students will need to face after finalizing their architectural education. The paper presented one experimental educational approach which is still under examination and acts as an ongoing research to better formulate the needed approach suitable for first year architecture students in Cairo University.

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