

FILING THE GAP BETWEEN ACADEMIA AND PROFESSIONAL PRACTICE IN ARCHITECTURE IN JORDAN¹

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Abstract

This paper conducts an experimental study, in order to find new and improved methods for filling the gap between the academic knowledge provided by universities and colleges, with the professional practice in the designing field of architecture in Jordan.

The experiment was held in the second semester of the academic year (2016-2017), on third-year bachelor architectural students, at Jordan University of Science and Technology, Irbid/Jordan.

It was expected that students with more interaction with the professional practice system, will have a more developed and coherent design projects, than those whom all the design process will take place within the design studio.

This experiment is focused on the building material sector of the profession especially white cement and its potential to enhance students' skills in understanding material characteristics and its effect on the designed architectural product.

Keywords: *filling the gap, architectural design, building materials, white cement, professional practice.*

1. Introduction

Recently, the focus on filing the gap between academic knowledge and professional work in the architecture field has been increasing all over the world. Jordan is not an exception, many students struggle after graduating from universities, when they face the reality of how different, complex and precise working on real projects is. This issue manifest as students of architecture are engaged in studio design only, which is limited in resources.

¹ My sincere gratitude to the Arab Company for the White Cement Industry ACWCI for their cooperation in applying this experiment.

In her study, Ann Heylighen stated: "Rather than the sole concern of schools and universities, Learning should be considered a life-long activity that takes place in partnership between students, teachers, parents, professionals and society at large". (Heylighen, 2003). Universities in Jordan already have started to be aware of this; moreover, some of them were and still experimenting new teaching methods for design courses. A valuable example about how that can be applied was discussed in (Destination: Practice), authors were convinced that filling the gap between academia and practice can be achieved by hiring practicing architects for studio teaching. (Neuckermans, and Heylighen, 2001). This happened recently in many Universities in Jordan, like Jordan University of Science and Technology, and German Jordanian University.

The approach this experiment took in filling the gap between academia and professional practice was different at some level, it was not done by bringing practicing architects to the studio, nor taking internships by students in architectural offices, it concentrated more on architecture as a craft; dealing with realistic building materials and its effect on the resulted designed product, using white cement as the main driver in the design course through this specific experiment.

This paper will provide a new example of practice involvement in the academic field, and how can that improve designing and understanding skills for students of architecture. Furthermore, it will examine the effects of new teaching methods on the design process, and its effect on the final architectural product.

2. Knowledge Exchange in architecture field

Ann Heylighen explained in her article, what distinguishes academic knowledge in architectural education among other academic fields. It is the structure of design studios in architecture and its way to prepare students for professional practice. Design studios vary with their different objectives, emphases, technologies and structure; she added that these studios have unique quality which differentiates them from other educational programs. Based on that, she wanted to connect the design studio with the world of practice. (Heylighen, 2003)

Beside individual students, architectural education at large would benefit from filling the gap between academia and professional practice. Developing students' learning capabilities is as important as teaching the knowledge and skills needed to practice a specific profession. (Lammertyn, 2001 as cited in Heylighen, 2003) In mind the gap article, the

authors have argued that the knowledge should be exchanged in architecture from both sides between academia and practice -while respecting the individuality of both-, meaning that practical knowledge is also important to enhance the academic outcomes. “In case of architecture, however, we would argue that this flow should be bi-directional: from academia to practice, but also the other way around” (Heylighen, Lindekens, Martin, & Neuckermans, 2006).

To support their argument, they suggested two mechanisms for knowledge exchange. The first one is by engaging seasoned professionals to provide practice-based knowledge for students and interns. The second one is the data collection through participatory observation of competition design. They also provided cases of professional architects working in collaboration with academic researchers. (Heylighen, Lindekens, Martin, & Neuckermans, 2006). While the experiment this article illustrates suggesting a third mechanism, by attracting professionals from the building material sector to be engaged in the design teaching process, the Arab Company for White Cement Industry ACWCI was approached in order to discuss ways of cooperation to start applying the experiment on ground, they approved and were very enthusiastic to witness the results of this new knowledge exchange method.

3. The cooperation Experiment

In Europe, there is a debate about whether academic research in areas of design practice is different from the research in other fields. The authors of *Architectural Practice and Academic Research* stated that Practice based research PBR should not be apart from traditional concepts of academic research. In fact, it is a subcategory of traditional academic research. Even academic research that is developed within the traditional scientific fields contains practical elements such as experimentation, data collection, observation and interviewing. Maintaining the link between design research and traditional academic research is necessary because it will enable design to show that it conducts high quality academic research. (Biggs, and Büchler, 2008)

Therefore, this practical experiment of bringing the two worlds of academia and practice together will be of great value to “Practice based research” “PBR” (Biggs, and Büchler, 2008); considering that it aims to examine the relationship between the design process and the involvement of practical work inside and outside the design studio, also to

produce better understanding for architectural elements especially building materials and its effect on architectural design. Moreover, its attempt to improve design skills and practice of architecture students, and last but not least it will suggest new methods for filling the gap between the academic knowledge and professional practice of architecture in Jordan, since it is the first time to happen in Jordan.

The hypothesis here was based on that the involvement of practical experiences in building materials with the academic knowledge of design will improve students understanding for realistic architectural elements and strengthen their design skills.

3.1 Methodology

A “Practice based research” “PBR” (Biggs, and Büchler, 2008) is the core of this study as it is an experimental study.

3.1.1 Experiment settings

- Location: it was held at Jordan University of Science and Technology, Irbid/Jordan.
- Time duration of the experiment: the experiment extended through the second semester of the academic year (2016-2017), around four months.
- Course description: the experiment happened during Architectural Design Four course [ARCH312], five credit hours for the course, two days a week. The course consisted of five sections, each section has an individual instructor, and one course coordinator for the five sections, doctor Anwar Ibrahim.
- Sampling: it was done on third-year bachelor architectural students. The section which the experiment was applied on, was supervised by the author of the paper, Arch Rania Al rawwash, it was section four and it consisted of 16 students, all of them were part of the experiment². The selection of third-year students was based on the required skills gained by architecture students for experiment purposes such as developed design skills and architecture understanding, also the nature of the proposed design projects for this academic phase that fits perfectly with the study intensions.

² One of the students was banned from the course due to his high absence percentage, so he did not proceed the experiment with the rest of the class.

- Design project description: Each four students were assigned to study a star-architect, then, they were required to design a mosque individually based on the architect's design methodology. The design has to reflect depth in conceptual aspects and formal translation that departs the dominant classical forms of this building type. They were also required to critically question the necessity of the conventional traditional elements of the mosque like domes and minarets³.

3.1.2 Experiment explanation

The cooperation Experiment between third-year architecture students at Jordan University of Science and Technology and the Arab Company for the White Cement Industry ACWCI was suggested by the paper's author. The first meeting between the author and the general manager of the company, Eng. Khaled Tarawneh was before the beginning of the second semester of the academic year (2016-2017), on Jan. 26, 2017. It was held to discuss ways of cooperation to support and enrich knowledge exchange between academia and practice, where it resulted in a number of vital goals; beginning at exposing students to professional practice to make a linkage between what is being taught inside lecture halls with the actual applications in the real world. As well as producing better practical understanding for building materials; its physical, chemical, and designable characteristics' and its uses especially the white cement material. Ending with suggesting white cement as one of the main modeling materials for architectural physical models during the design course, by taking advantage of the material design and physical potentialities.

In order to apply these goals, as well as to start producing tangible results, a detailed action plan on a limited time base -the second semester of the academic year (2016-2017)- was organized. Starting with presenting an introductory lecture about white cement, its uses and characteristics at Jordan University of Science and Technology. A site visit to the Arab Company for the White Cement Industry ACWCI factory at "Aldlail" area during the first stage of the academic semester was assigned. Resulting in the design and model making stage, including a series of workshops held by the company experts in dealing with white cement as a building material to help students dealing with the molding and mixing techniques for their models through design course studios.

³ Design project description was done by the course coordinator of architectural design four course, at the second semester of the academic year (2016-2017), Doctor Anwar Ibrahim.

The introductory lecture on white cement was presented by lab and quality control manager, Mr. Laith Tarawneh, a 2-hour scientific lecture was open to all the students of the architectural department from all the different years to widen knowledge spread range. The lecture was of great importance in raising students' awareness about white cement physical and chemical characteristics, its uses as a building material with the newly up to date uses on the practical field such as its usage as an insulation material, and the ongoing research about futuristic usages for this pioneer material, and its role to friendly replace the traditional natural stone image that overcomes Amman -the capital of Jordan- architecture over the past years, due to its durability, strength and relatively low cost in relation to the natural stone⁴.

The lecture ended with an open discussion with students and lots of raised questions from their side, some of them were answered, others were open for future research by the students. Students are in need of this kind of practical knowledge exchange in the form of lectures presented by practicing professionals, not to mention the importance of the future outer research that is being done afterwards which enhances the students research abilities, and forms a knowledge extension base provided by these lectures.

Arranging a site visit to ACWCI factory at "Aldlail" area on March 21, 2017. At this stage of the study, the experiment was tested on a more focused group of students, it was applied only on the sixteen students of section four of the architectural design 4 course, as a part of the design-studio outer visits. The visit was divided into two parts, the first one was a factory tour led by lab and quality control manager, Mr. Laith Tarawneh, and some of the factory employees' experts. It was done to introduce the production process for the white cement raw materials mixtures', until it is ready as white cement diverse products, which consists of Grinding, Burning, Cooling, Drying, Packaging, and Storage by explaining where each part of the process happens inside the factory and how.

The second part was essentially a practical part, that was guided by factory employees' experts, it consisted of introducing ways of dealing with white cement when it is ready to use, practically by making realistic samples of white cement physical models in front of the students, using them as explanatory tools of how to make white cement molds, mixtures, additives and water percentages for each mix, also the needed moisture levels and time duration until white cement model is solid and ready. For most of the students, visiting a

⁴ A part of the given information in the lecture that was presented by lab and quality control manager, Mr. Laith Tarawneh at the Arab Company for the White Cement Industry ACWCI.

material factory was a first-time experience, for all of them, visiting a white cement building material factory was their first, which it gave them a precise understanding for this building material, further, it opened new dimensions in dealing with it especially as a physical model making tool of their architectural building designs. This example of practical knowledge gained by factory site visits would greatly help in filling the gap between academic knowledge and professional practice, especially on the craft side of the architectural profession which has been recently neglected due to the technology invasion of the profession.

Students started to experiment with the white cement during the design course studios by now not only as a physical model making tool benefiting from its flexibility, and potentiality in producing models that have a considerable illustrative design image, but also as a true building and/or insulation material through their mosques' designs. After an intensive previously gained scientific and practical knowledge about white cement, each student was encouraged to use this material freely in a way that serves his/her design approach, in producing a comprehensive design output. This stage was accompanied by several workshops that were led by the experts of the ACWCI factory through the design studios, to guide students in the model making process of preparing molds, mixtures, additives, water percentage addition, temperature and moisture control, and adhesives, due to its complexity in comparison with the traditional model making techniques known by architecture students over the years depending mainly on recycled paper.

The results were outstanding, several students used white cement as a design tool during the early stages of the conceptual thinking to create a better understanding for their architectural ideas, and the conceptual form they are envisioning figure 1 a+b. Some of them used it to illustrate parts of a building that has many details which need to be shown in a larger scale for better visualization. For instance, one student has a complicated detached minaret, it was made of white cement on reality too, therefore he made a larger individual physical model to the minaret by the white cement figure 2. Others used it as a tool to create site topography which has a slope section, in order to emphasize the strong integration and harmonic relationship between the building (the mosque) and the site by creating sectional architectural physical model figure 3.

This is only a sample of the distinguished results of what students were able to produce after going through this experiment. At the project final day, all instructors had to

circulate between the five sections and put grading for all the students⁵. Section four -which the experiment was held on- had extraordinary feedback from the instructors, the depth in thinking through model making as a design tool was expressively shown through the student's work.

Figure 1 a: Student's Work, Mahmud Haj Yahya



Source: Photo taken by author arch. Rania Al rawwash

Figure 1 b: Student's Work, Seba Habashneh



Source: Photo taken by student Seba Habashneh

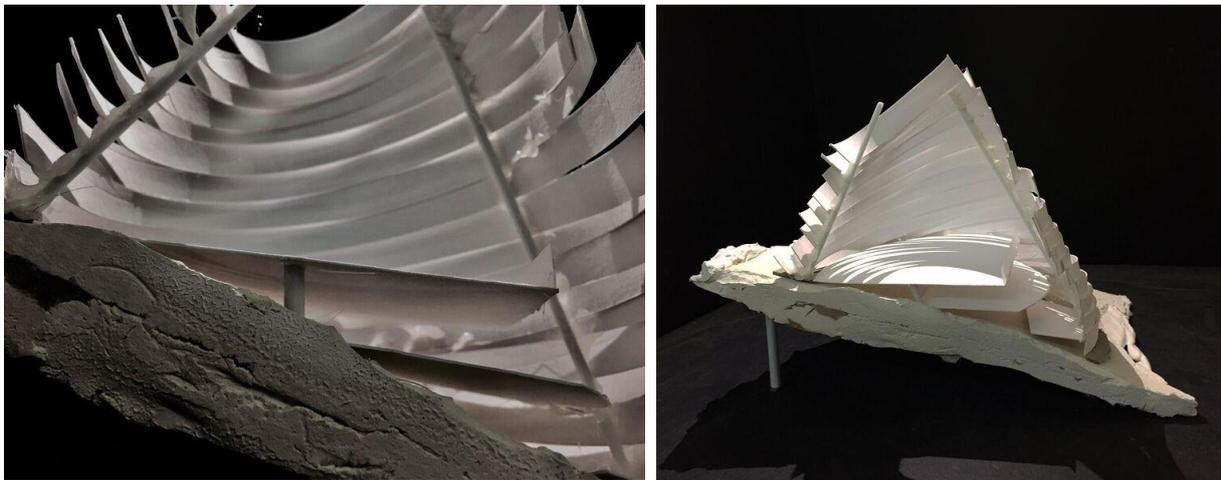
⁵ Instructors are course coordinator Doctor Anwar Ibrahim, course instructors architect Anwaar Banisalman, architect Basma Adel, architect Nida Alhamzeh and architect Rania Al rawwash.

Figure 2: Student's Work, Baraa Mteir



Source: Photo taken by student Baraa Mteir

Figure 3: Student's Work, Owais Kattan



Source: Photo taken by student Owais Kattan

Furthermore, the cooperation experiment was presented at the Arab International Conference and Exhibition in White Cement and Building Materials, which was held in Al Hussein Sport City, Amman/Jordan on May 8, 2017 and May 9, 2017. The conference was organized by the Arab Company for White Cement Industry ACWCI, with the participation of the leaders' companies in building material and construction sectors, both nationally and internationally. The author of the paper gave a lecture at the conference called "The Aesthetics of White Cement and its Uses in the Past and the Present". The lecture explained the advantages of white cement and its wide range uses, also the collaboration between architectural students at architectural design 4 course with the ACWCI as an experimental

study. Results as architectural products (posters and models) were exhibited during conference days.

3.2 FUTURISTIC VISION

The general manager of ACWCI, Eng. Khaled Tarawneh praised the outstanding educational level that Jordan University of Science and Technology JUST architectural students have, he also emphasized the importance of the continuation and development of such experiments, that aims to minimize the gap between academic field and professional practice. Both practicing professionals, either architects or professionals working in the building material and construction sectors nationals and internationals, also academicians from several Jordanian universities who attended the conference and have checked out students' work at the conference exhibition had the same impression. One of the valid future suggestions, is to start to learn architecture design by building one to one scale small projects by students on a semester or a year base, many architectural schools in the west and the US has similar approaches and programs in order for students to gain practical knowledge. In Jordan, it is still shy attempts and not systematically designed through the curriculum. It is very important to work on including more practical courses in Jordanian architecture schools' curriculums. As a fast step forward, an elective course was suggested by the author to teach material advance studies, the course will focus essentially on research and practical part in the building material field. The course has initial approval to be on the first semester courses of the upcoming academic year (2017-2018).

4. Conclusion

The gap is affecting both sides; academic knowledge on one hand and professional practice on the other, this resulted in providing less qualified architects for the market, thus, affecting the quality of the built environment in the long run, in my opinion. After a thorough research, most of the evidences suggested that knowledge exchange is a crucial part of the solution, that is why practicing professionals need to revise and expertise from the academic knowledge provided by universities, in order to establish evidence based design through scientific research, to raise the profession standards. On the other side, students will gain practical experience and will be up to date with what is recent in the profession that is growing vastly.

In Jordan, the architectural education system lacks interventions that aims to fill the gap between both worlds (academia and practice), this experiment provided a trial to that through an architectural design course by reaching for the practicing society for knowledge exchange, organizing practicing professional lectures, and inside design studio workshops. Design studios not only are used for teaching architectural design, it is a comprehensive educating approach that must deal with the various architectural elements, that is why this experiment was proceeded as a material lab this time, and it could be altered each semester to adapt another architectural element to explore the potentiality of it in improving student understanding to the building. This paper presents an attempt of producing better understanding for students of the various architectural elements such as building materials and other forces which affect the designing process, eventually resulting in improving the final architectural product, through the academic phase of architecture by coming closer to the practice world. It is just one step towards the solution, the next step should take the development of the architectural education system in Jordan as a whole and direct it toward new systems taking into consideration more practical methodologies, this can be achieved by improving architectural curriculums to make such experiments and interventions naturally integrated to the architectural educational system in Jordan.

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