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Importance and Role of Live Projects in Architectural Education Using a Descriptive and Analytical Approach

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Abstract: In view of the knowledge gap between what students learn in a design studio and what they do in their future work in the labor market, this study assumed that live projects supported architectural education, contributed to the development of students' capabilities, prepared them to enter the labor market, and were complementary to their knowledge acquired in traditional design studio. This study aimed to evaluate the importance of live projects and find out the extent to which students benefit from them in overcoming employment difficulties to easily get into the labor market. A descriptive and analytical approach similar to global experiences was used to monitor the progress of senior students in live projects. Measurement mechanism, such as questionnaire and observation, was used to know the skills of students acquired during the experiment. The experiment results showed that most of the students agreed that live projects provided realistic learning experiences different from the traditional design studio. In addition, the results showed that live projects helped students develop many skills, such as negotiation, persuasion, teamwork, etc. which they did not acquire through virtual projects. In the design studio, live projects were considered as a successful educational method that simulated reality and prepared the students for their professional practice.

Keywords: Live projects; Design studio; Architectural education; Professional practice

1. Introduction

The idea of live projects began in the University of Birmingham in the United Kingdom in the 1950s, because fresh graduates never dealt with live projects and clients and had hug problems in adapting themselves to the labor market (Brown, 2012). Then the idea appeared in the academic circles in universities of Iraq because students did not put their learnt knowledge into any practical application. Most design studios did not adopt a comprehensive approach to architectural education to enhance design awareness in many aspects, such as social, cultural and environmental aspects, cooperation and teamwork, criticism, implementation methods and so on, and architecture schools did not adequately prepare students for their future work, thus making many students generally suffer from a lack of knowledge and professional practice in the labor market. Therefore, it is urgent to increase the awareness of students through realistic educational practices and activities, which take into account these design aspects. This study aimed to find educational methods to prepare experienced architects to easily go to the labor market, guide their design thinking towards reality, know how to deal with clients and take into account user requirements, budgets and so on.

Real projects were designed to make students deal with real clients, thus preparing them better for their professional practice. Live projects included experiential learning, in which learners had direct contact with the facts being studied and learned by experience or by putting all theoretical methods in action, and were exposed in some way to the limitations that they may encounter outside of academic circles. It was an opportunity to develop complex teaching methods to enrich architectural education and professional practice.

A descriptive and analytical approach was adopted, by reviewing previous studies, proposing a vocabulary for the necessary skills of students, and measuring them using live projects similar to international experiences. Questionnaires were provided for students, which included questions about the skills acquired in real projects before and after experiment, to get results. The study sample was a group of nine senior students from the

University of Mosul, divided to two teams. The results indicated that the students acquired many important skills and practical knowledge during the experiment, which they did not acquire in traditional design studio projects. To sum up, the research showed that live projects were complementary to the design studio and both of them were equally important.

1.1 Definition of Live Projects

A live project is defined as a type of design project, where the work environment for students has changed from a design studio to a live workplace, which differs from a typical studio project in its interaction with real clients or users. The live project consists of negotiating a briefing, schedule, budget, and product between the client and the educational institution, which helped students develop many skills, such as teamwork, communication skills, reporting, negotiation, marketing, dealing with emergencies, and promoting on social media (Harriet & Widder, 2014; Sara, 2011). Anderson (2017) also defined live projects as a bridge to education based on research, where related teachers were interested in the learning process itself, instead of the final product. Therefore, it is necessary to evaluate the live projects, which include the needs and desires of users and customers. However, it is architecturally difficult to evaluate the live projects using the standards, which are used to critique or evaluate traditional studio projects. Several studies (Salama, 2016) (Watt & Cottrell, 2006) (Brown, 2012) showed that the educational model of live projects adopted the field experience method for education, where students participated in all decision-making education processes. Instead of playing the traditional student-teacher role, students identified problems and resources with the help of facilitating teachers, learned problem-solving techniques, standardized solutions and worked with facts. Carolyn et al. (2013) defined live projects as effective educational strategies to connect the academic world with the outside. Although live projects were important, they required great administrative resources and efforts. Rodriguez (2017) concluded that live project was a very common educational method in other education fields, such as business administration, law, medical specialties, media, etc. In architectural education, it was used to provide students with real and tangible design problems.

Therefore, the live project is a simulation of professional practice, which aims to expose students to real situations and problems and enables them to learn to design for real customers and users, rather than hypothetical ones. Students are concerned with the design process rather than the product. In addition, the live project enables students to develop several skills, such as marketing and promoting their work, preparing reports, negotiating, setting a schedule, observing the budget, etc. The live project may reach the construction stage.

1.2 Research Problems

This study aimed to address the following two research problems:

- Knowledge gap between what students have learned in the architectural design studio and what they will do in their future work in terms of design, project implementation, supervision, administrative matters, marketing, and so on.
- No clear vision to assess the importance of live projects in architectural education and the efficiency improvement of students in Iraqi universities in general, particularly the University of Mosul.

1.3 Research Purpose

This study aimed to:

- Evaluate live projects and measure their impact on the quality improvement of architectural education and the efficiency improvement of students in Iraqi universities in general and the University of Mosul in particular.
- Study how to enable students to acquire necessary capabilities to easily enter the labor market and face difficulties in their future work.

1.4 Research Hypothesis

Live projects support architectural education, increase students' competence, prepare them to enter the labor market and practice their professional skills, and reduce the lack of knowledge in the architectural design studio.

2. Literature Review

2.1 Between Studio and Street: The Role of the Live Project in Architectural Education (Sara, 2004)

Based on the lack of knowledge in the traditional design studio and its separation from external influences, such as the client, the user, etc., the architectural colleges in the United Kingdom began to adopt the teaching method based on live projects. This study aimed to define the role of living project in architectural education, suggest

better education strategies, and explore the living project as an educational process instead of the final product. After studying the live project in the context of education theory and related practical examples, it was concluded that the live project enabled students to learn and develop skills that were not possible in the academic studio, such as communication skills, writing contracts, asking questions, listening and presenting, dealing with craftsmen and people in other disciplines, linking the architecture college with the community, applying theoretical knowledge in practice, raising the students' work to a professional level, collaborative learning, including guidance for partnerships among students, learning from other students and teamwork, increasing the motivation to develop project management, problem-solving and organization skills, developing an understanding of the construction process, learning creative design with constraints, and reducing the domination of teachers.

2.2 Community as Classroom: A Live Project Case Study from Montreal, Canada (Richard, 2012)

This study aimed to link the academic circle with the community using many vocabularies, such as learning from others, working with the community, and solving problems. A social experiment was conducted through interconnected community projects, including reconstruction of two demolished schoolyards in Montreal of Canada. The design and construction involved approximately 100 students majoring in architecture, 50 students from elementary schools, and builders, teachers, principals, craftsmen, and parent volunteers. It was a successful social and educational experience, which made students get out of classrooms and studios isolating them from reality.

2.3 The Changing Nature of Architectural Education: Do Live Projects Prepare Students for the Realities of Architectural Practice? (Lofthouse, 2013)

This study worked on the live project method, i.e., students worked without salaries to gain experience after graduation, and aimed to verify the importance of live projects because of the large gap between architectural education and work requirements. A hypothesis was proposed that the live project developed additional skills of students compared with the traditional design studio, which prepared them for professional practice. Three case studies were included in this study, namely, a two-week studio project in Oxford with a real client, a field trip to India to build a school for communities affected by the Asian tsunami in 2004, and wing project building as a competition for extra curricula by the university. Finally, it was concluded that both the live project and the traditional design studio were equally important, and provided students with different experiences. The live projects conducted in the study did not focus on the final product but rather the design process, and evaluated the teamwork of students and their ability to negotiate and communicate with clients and convince them. Due to short duration, live projects were difficult to evaluate, because there were not clear standards for them.

2.4 A Method for Experiential Learning and Significant Learning in Architectural Education via Live Projects (Rodriguez, 2017)

This study showed that traditional studio projects were becoming increasingly common in architectural education around the world, which focused on solving hypothetical design problems possibly inspired by reality. However, it was difficult for lectures or studio projects to teach necessary skills, such as dealing with clients and users, adapting to changing circumstances, working with different disciplines, negotiating, and project management, etc. This study proposed a teaching method, which focused on enhancing learning through live projects and provided support for studio-based projects. In order to develop and test this method, 15 different live projects were designed and built over a period of four years, including the participation of 170 university students, various domestic and international teachers, six sponsors from the construction industry, and 12 children institutions. The study results indicated that the traditional design studio succeeded in developing problem-solving skills to some extent. However, knowledge needed to be supplemented by experiential learning methods using live projects, which enabled students to develop skills, exposed them to different situations and perspectives, and allowed them to gain experience in solving real design problems before graduation.

2.5 Collaborative Learning in Architectural Education: Benefits of Combining Conventional Studio, Virtual Design Studio and Live Projects (Rodriguez et al., 2018)

This study dealt with the possibility of incorporating the Virtual Design Studio (VDS) with the traditional studio and live projects. The live project was an alternative method of providing students with real and concrete design problems, which required negotiation with the client and development of a project schedule and budget. Possibility of integrating the above three methods was verified using two case studies, which were projects between the University of Los Andes in Colombia, and the University of Nottingham in the United Kingdom. The projects were divided into two stages. In the first stage, general concepts were built through VDS, and then proposals were

developed for two weeks in the traditional studio. In the second stage, which lasted for six weeks, data was collected through questionnaires and interviews with groups of students and professors in a live project style. The study proved that students worked as a team and built confidence in their own abilities when working on a real project. In addition, live projects gave students an opportunity to interact face to face and more motivated them to work on a real problem and deal with the community, such as clients or people in other disciplines, because of participation of students from two universities. These projects also reduced bias because students were exposed to the opinions of a group of participants instead of their studio teachers only. It was believed that this study could lead to amending the curricula in countries, which did not oblige their graduates to attend training before starting to work.

It was concluded that the previous studies emphasized the importance of live projects and their role in developing the professional performance of students in architectural education, as design studios isolated students from the real world. In addition, live projects developed many skills that the students would need in their future work, such as dealing with a real problem or customer, working with various people in other disciplines, enhancing learning from others, designing with constraints, project management, and other professional skills. These studies also emphasized the importance of several skills, such as communication skills, including communication with customers, users, people in other disciplines and craftsmen, writing reports, preparing summaries, marketing, persuasion, negotiation, etc. Table 1 shows the most important skills emphasized by these studies, and Table 2 shows the most important vocabulary extracted from the theoretical framework.

Table 1. The most important skills confirmed by the studies

No.	Vocabulary	Study 1	Study 2	Study 3	Study 4	Study 5
1	Communication with the client	*		*	*	*
2	Negotiation	*		*	*	*
3	Listening and viewing	*				
4	Collaborative work	*	*	*	*	
5	Learning from others	*	*	*		
6	Communication with team members					
7	Working with people in other disciplines	*				*
8	Communication with craftsmen	*				*
9	Making a schedule	*		*	*	
10	Project management	*				*
11	Making a project budget	*		*	*	
12	Preparing the summary	*				
13	Building confidence in their abilities			*	*	
14	Motivation	*			*	
15	Reducing bias				*	
16	Solving problems		*			*
17	Understanding the construction process	*		*		
18	Designing within limitations	*		*		
19	Providing benefit to society		*	*	*	*

Table 2. The most important vocabulary of the theoretical framework

Value	Secondary vocabulary	Main vocabulary
Live projects	Working with an architectural team	• Discussion and constructive criticism of team members to propose better alternatives. • Explanation of ideas. • Listening and sharing ideas with the team. • Ability to divide tasks and organize work.
	Communication with people in other disciplines	• Exchanging ideas and requesting consultation with people in other disciplines concerning their specialization.
	Negotiation and persuasion	• No ability to negotiate and persuade. • Limited ability to negotiate and persuade. • High ability to negotiate and persuade.
	Listening	• No ability to listen to others to exchange ideas. • Limited ability to listen to others to exchange ideas. • High ability to listen to others to exchange ideas.
	Designing for a real customer	• Influence of customer requirements on design. • Influence of customer opinions on the final product. • The design was influenced by the user's behavior, personality, and orientations.
	Real project design	• Effect of site conditions on the final design.

	• Impact of the budget on the final product. • Certain restrictions imposed on the design process. • Time management and project delivery on time. • Level of enthusiasm of students when designing a real project.
Learning from others	• Teamwork stimulated ideas. • Teamwork gave more alternatives and design solutions. • When working with a group, individual ideas were dropped, and the majority opinion was adopted.
Choosing the appropriate materials	• In terms of permanence. • In terms of quality. • In terms of durability. • In terms of insulation and resistance to climatic conditions. • The costs.
Knowledge of construction systems	• No knowledge of construction systems. • Limited knowledge of construction systems. • Extensive knowledge of construction systems.
Knowledge of building codes	• No knowledge of building codes. • Limited knowledge of building codes. • Extensive knowledge of building codes.
Considering the budget when designing	• The client's budget was not taken into consideration when designing. • Limited consideration was given to budget when designing. • The client's budget was taken into consideration when designing.
Knowledge of professional ethics	• No knowledge of professional ethics. • Limited knowledge of professional ethics. • Extensive knowledge of professional ethics.
Communication with craftsmen	• Explanation of ideas. • Free hand.
Understanding the construction process	• Not understanding the construction process. • Limited ability to understand the construction process. • High ability to understand the construction process.
Writing reports, preparing summary, and drafting contracts	• Not knowing how to write reports, prepare summaries and draft contracts. • Limited knowledge in writing reports, preparing summaries, and drafting contracts. • High knowledge in writing reports, preparing summaries, and drafting contracts.
Marketing	• Not knowing business marketing. • Limited ability in business marketing. • High ability in business marketing.
Making a project budget	• No ability to make a project budget. • Limited ability to make a project budget. • High ability to make a project budget.
Making a schedule	• Inability to make a project schedule. • Average ability to make a project schedule. • High ability to make a project schedule.
Self-organization and division of tasks	• No ability in self-organization and division of labor. • Limited ability in self-organization and division of labor. • High ability in self-organization and division of labor.

3. Methodology

The study used an analytical and descriptive approach to:

- Create a theoretical framework from previous studies and extract the research vocabulary.
- Determine the study samples.
- Select a measurement tool.
- Applying the measurement tool to the samples by introducing a group of senior students to the live project experiment, similar to international experiments.
- Access to results and conclusions.

4. Application Framework

4.1 Study Population and Selection of Samples

The study sample included a group of nine senior students from the University of Mosul divided to two teams, which accounted for 25% of the total senior students. Due to logistical difficulties, the samples were confined to nine students only, who volunteered to work on the project.

4.2 Method of Measurement

The method of measurement was as follows:

Experiment: The experiment was applied to the study samples by selecting a residential house project. The students were divided into two groups under the supervision of the researchers. The design of each group was client-integrated, including schemes, facades, and sections. The students were responsible for negotiating with the client, presenting, and explaining their ideas, studying the materials in the market in terms of durability, insulation, and costs, as well as knowing the types of construction systems, the pros and cons and costs. On this basis, the appropriate materials and structural system were selected in accordance with the client's budget. In addition, the students worked as a team with the engineers in other disciplines in the office, such as civil, mechanics, electricity, etc., in order to consult on building construction and service matters. Then a questionnaire was distributed to the students, including questions before and after the experiment, as shown in Figures 1 and 2. The experiment was conducted in the Tanasouq Office of Engineering in Mosul for 20 days.

Figure 1. Students during the experiment

Figure 2. Students during the experiment

Observation: The method of simple observation was used to observe the study population in the natural state.

5. Results

5.1 Before Conducting the Experiment

The results before the experiment are shown in the Table 3.

Table 3. Statistics before the experiment

Variable	Arithmetic mean	Standard deviation	Variation coefficient	Response measurement								Agreement ratios	Response intensity
				I strongly agree		I reasonably agree		I slightly agree		I don't agree			
				No.	%	No.	%	No.	%	No.	%		
X1	2.222	0.666	30.000	0	0	3	33.3	5	55.6	1	11.1	88.9	55.555
X2	2.444	0.881	36.079	1	11.1	3	33.4	4	44.4	1	11.1	88.9	61.110
X3	2.555	0.726	28.426	1	11.1	3	33.3	5	55.6	0	0	100	63.890
X4	3.000	1.118	37.267	4	44.4	2	22.3	2	22.2	1	11.1	88.9	75.000
X5	2.888	0.781	27.060	2	22.2	4	44.5	3	33.3	0	0	100	72.222
X6	2.444	1.236	50.565	3	33.3	0	0	4	44.5	2	22.2	77.8	61.110
X7	3.000	1.000	33.333	3	33.3	4	44.5	1	11.1	1	11.1	88.9	75.000
X8	2.555	0.881	34.509	2	22.2	1	11.1	6	66.7	0	0	100	63.890
X9	1.555	1.013	65.170	1	11.1	0	0	2	22.2	6	66.7	33.3	38.890
X10	1.555	0.527	33.880	0	0	0	0	5	55.6	4	44.4	55.6	38.890
X11	2.222	0.971	43.732	0	0	5	55.6	1	11.1	3	33.3	66.7	55.555
X12	1.333	0.500	37.500	0	0	0	0	3	33.3	6	66.7	33.3	33.332

X13	1.555	0.726	46.700	0	0	1	11.1	3	33.3	5	55.6	44.4	38.890
X14	2.222	0.666	30.000	0	0	3	33.3	5	55.6	1	11.1	88.9	55.555
X15	2.666	0.866	32.475	2	22.2	2	22.2	5	55.6	0	0	100	66.667
X16	2.333	1.000	42.857	1	11.1	3	33.4	3	33.3	2	22.2	77.8	58.332
X17	2.333	1.118	47.916	2	22.2	1	11.2	4	44.4	2	22.2	77.8	58.332
X18	2.222	0.971	43.732	1	11.1	2	22.3	4	44.4	2	22.2	77.8	55.555
General Average	2.284	0.869	38.956		14.18		22.86		40.1		22.8	77.1	57.098

5.2 After Conducting the Experiment

The results after conducting the experiment are shown as Table 4:

Table 4. Statistics after the experiment

Variable	Arithmetic mean	Standard deviation	Variation coefficient	Response measurement								Agreement ratios	Response intensity
				I agree greatly		I agree moderately		I agree a little		I do not agree			
				No.	%	No.	%	No.	%	No.	%		
y1	3.555	0.527	14.820	5	55.6	4	44.4	0	0	0	0	100	88.89
y2	3.888	0.333	8.571	8	88.9	1	11.1	0	0	0	0	100	97.22
y3	3.555	0.527	14.820	5	55.6	4	44.4	0	0	0	0	100	88.890
y4	3.444	0.726	21.091	5	55.6	3	33.3	1	11.1	0	0	100	86.110
y5	3.333	0.707	21.213	4	44.5	4	44.4	1	11.1	0	0	100	83.332
y6	3.888	0.333	8.571	8	88.9	1	11.1	0	0	0	0	100	97.222
y7	3.555	0.527	14.823	5	55.6	4	44.4	0	0	0	0	100	88.890
y8	3.333	0.500	15.000	3	33.3	6	66.7	0	0	0	0	100	83.332
y9	3.333	0.707	21.213	4	44.5	4	44.4	1	11.1	0	0	100	83.332
y10	3.333	0.500	15.000	3	33.3	6	66.7	0	0	0	0	100	83.332
y11	3.888	0.333	8.571	8	88.9	1	11.1	0	0	0	0	100	97.222
y12	3.666	0.500	13.636	6	66.7	3	33.3	0	0	0	0	100	91.667
y13	3.666	0.500	13.636	6	66.7	3	33.3	0	0	0	0	100	91.667
y14	3.888	0.333	8.5713	8	88.9	1	11.1	0	0	0	0	100	97.222
y15	3.666	0.500	13.636	6	66.7	3	33.3	0	0	0	0	100	91.667
y16	4.000	0.000	0.000	9	100.0	0	0	0	0	0	0	100	100.00
y17	3.555	0.527	14.823	5	55.6	4	44.4	0	0	0	0	100	88.890
y18	3.555	0.527	14.823	5	55.6	4	44.4	0	0	0	0	100	88.890
y20	3.555	0.726	20.431	6	66.7	2	22.2	1	11.1	0	0	100	88.89
y21	3.000	1.000	33.333	3	33.4	4	44.4	1	11.1	1	11.1	88.9	75.000
y22	3.444	0.726	21.091	5	55.6	3	33.3	1	11.1	0	0	100	86.110
y23	3.111	1.054	33.881	4	44.5	3	33.3	1	11.1	1	11.1	88.9	77.777
y24	3.888	0.333	8.5713	8	88.9	1	11.1	0	0	0	0	100	97.222
y25	3.666	0.500	13.636	6	66.7	3	33.3	0	0	0	0	100	91.667
y26	3.333	0.500	15.000	3	33.3	6	66.7	0	0	0	0	100	83.332
y27	3.444	1.013	29.432	6	66.7	2	22.2	0	0	1	11.1	88.9	86.11
y28	3.333	0.707	21.213	4	44.5	4	44.4	1	11.1	0	0	100	83.332
y29	2.444	0.881	36.079	0	0	6	66.7	1	11.1	2	22.2	77.8	61.110
General Average	3.511	0.573	16.982		58.77		35.69		3.65		1.98	98.07	87.797

6. Discussion

Previous studies focused on many vocabularies to develop architectural education and prepare students for professional practice. The most important vocabularies included “motivation” because, compared with traditional studio projects, live projects generated a higher degree of motivation among students, which was closely related to the participation of real clients and users and appreciation of clients for their work; “self-organization and project management” because the live project gave students an opportunity to assume responsibility by turning a typical teacher-led process to a process in which students assumed greater responsibility for project, group management, team organization, provision of resources, meeting management, and project completion on time; “learning from others and collaborative work” because teamwork was a positive element in the live project, which gave students the opportunity to learn from others and developed their ability to work in groups for their future work; “developing personal skills”, such as interaction with clients, effective communication with people involved in the design process, problem solving and strategic thinking, etc.; “preparing for professional practice, applying theoretical knowledge in practice, raising students’ work to the professional level, appreciation of students’ work, designing

with restrictions, building self-confidence, giving more role to students in the educational process, professionalism, architectural criticism, providing benefit to the community" by working on non-profit projects, such as developing housing in poor rural areas, developing public squares in the city center, or building schools in remote areas, with the client usually from civil organizations and charitable societies; "social and environmental sustainability" because many live projects were built using recycled materials, wastes and local materials to reduce transportation costs, and working on the same site inspired students to use unexpected materials in the project.

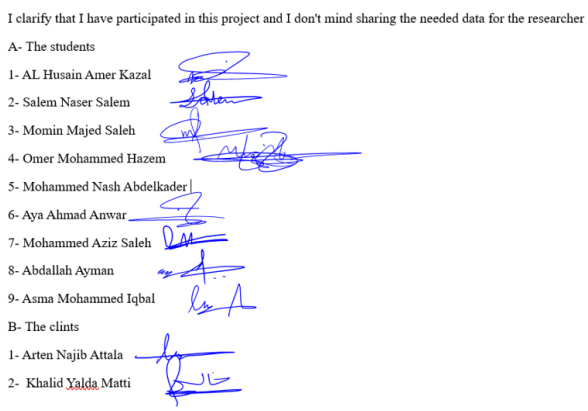
As shown from Tables 3 and 4, only 33.3% students communicated with people in other disciplines when designing in the studio, and considered material costs before the experiment, while 100% students acquired communication skills and considered the material costs after experiment. 55.6% of the students had an idea of project management before the experiment, while 100% of the students gained knowledge about project management after the experiment. 77.8% of the students had time management skills, enthusiasm, and motivation when designing in the studio, and were ready for professional practice and took into account the user's behavior and orientations in the design process, while 100% of the students acquired these skills after the experiment.

In addition, only 11% to 50% students had knowledge of material properties in terms of costs, durability, and insulation, 22.2% had no knowledge of all of the above, while the percentage ranged from 66.6% to 88.8% after the experiment, and 0% of them did not acquire any knowledge. After the experiment, 100% of the students found restrictions on the design process, the impact of budget on the final product, and the significant impact of client requirements on the design process. In addition, the students felt that the experience helped them build confidence in their abilities, and teamwork stimulated ideas by dropping their individual ideas and relying on the opinion of the majority. As for 88.8% of the students, due to the impact of customer opinion on the final product, they had to exceed the customer requirements to achieve a better product, and felt that teamwork gave more design solutions. While 77.8% of the students found that the experience helped them acquire new knowledge and skills that were not mentioned within the questions.

7. Conclusions

Live projects proved that students should be engaged with real projects, which improved their skills needed to get into more advanced projects. Live projects were not presented in the universities of Iraq previously. Although this experiment was simple, it proved the efficiency of live projects in enhancing the following skills for architectural students: Live projects gave students an opportunity to communicate with and consult people in other disciplines, such as civil, electricity, mechanics, psychology, etc.; taught students to design by taking into account the material costs and adhering to them, because the budget greatly affected the final product; taught students to consider the construction rules when designing and the conditions for obtaining a building permit; gave students an idea of project management, by making a project schedule, division of labor and etc., made them ready for professional practice and gave them a simple idea of project implementation; gave students an opportunity to learn from each other and exchange ideas, helped give more design solutions by giving up their individual ideas and relying on the opinion of the majority, gave students more design motivation and helped them build confidence in their abilities; made students consider the behavior, personality, orientations, and cultural level of the customer when designing because customer opinion greatly affected the final design and there were many restrictions on the design process; enabled students to acquire the skills of negotiating with the client, explaining ideas, and persuading others, and to learn how to criticize their colleagues in a professional manner; made students acquire the knowledge of building materials and finishes in the market in terms of insulation, quality, durability, permanence, resistance to climatic conditions, and costs; enabled students to acquire teamwork skills and communicate with the architectural team in live projects and the design studio.

Informed Consent Statement


I clarify that I have participated in this project and I don't mind sharing the needed data for the researcher

A- The students

1- AL Husain Amer Kazal

2- Salem Naser Salem

3- Momin Majed Saleh

4- Omer Mohammed Hazem

5- Mohammed Nash Abdelkader

6- Aya Ahmad Anwar

7- Mohammed Aziz Saleh

8- Abdallah Ayman

9- Asma Mohammed Iqbal

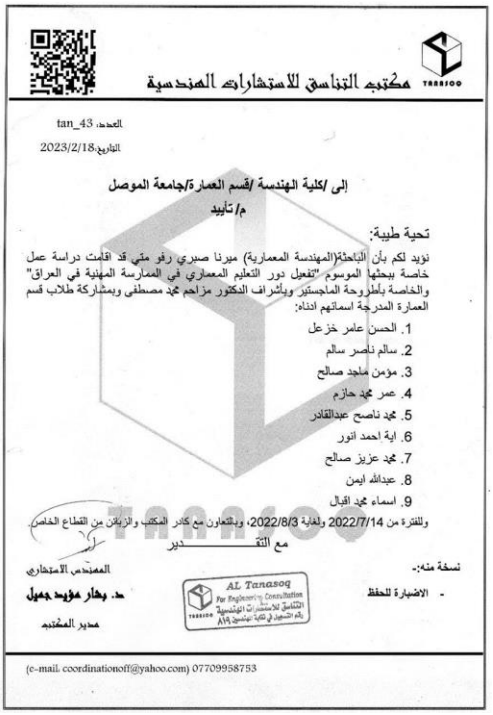
B- The clints

1- Arten Najib Attala

2- Khalid Yalda Matti

Data Availability

(1) A support document from the company where the experiment was conducted



مكتب التناسق للاستشارات الهندسية

العدد: tan_43

التاريخ: 2023/2/18

إلى /كلية الهندسة /قسم العمارة/جامعة الموصل

م/ تأييد

تحية طيبة:

نويد لكم بأن الباحثة(المهندسة المعمارية) ميرنا صبري رفو متي قد اقامت دراسة عمل خاصة ببحثها الموسوم "تفعيل دور التعليم المعماري في الممارسة المهنية في العراق" والخاصة بأطروحة الماجستير وبأشراف الدكتور مزاحم محمد مصطفى وبمشاركة طلاب قسم العمارة المدرجة اسماتهم ادناه:

1. الحسن عامر خزعل
2. سالم ناصر سالم
3. مؤمن ماجد صالح
4. عمر محمد حازم
5. محمد ناصح عبدالقادر
6. اية احمد انور
7. محمد عزيز صالح
8. عبدالله ايمن
9. اسماء محمد اقبال

وللفترة من 2022/7/14 ولغاية 2022/8/3، وبالتعاون مع كادر المكتب والزبائن من القطاع الخاص.

مع التقـــــــــدير

المهندس الاستشاري

د. بهار مؤيد جميل

مدير المكتب

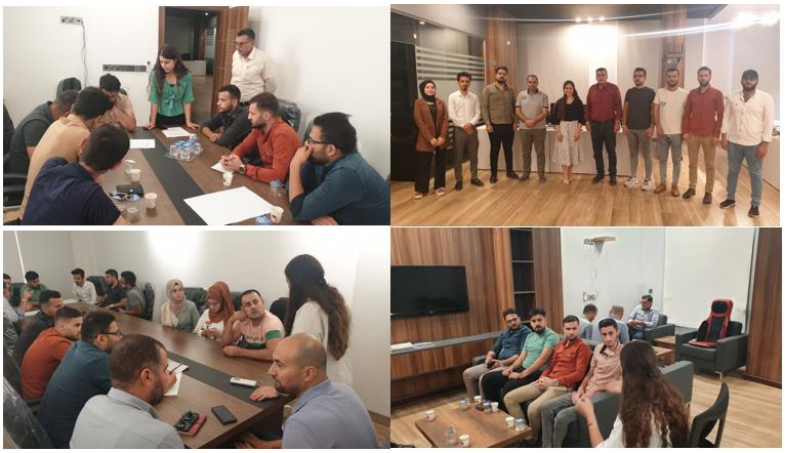
AL Tanasoq For Engineering Consultation

نسخة منه:-

- الاضبارة للحفظ

(e-mail. coordinationoff@yahoo.com) 07709958753

(2) Some pictures from the experiment



(3) Customer phone number

Arten Najib: 009647511892091

Khalid Yalda: 009647708253733

(4) Files related to the experiment will be sent with the email as a rar file

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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Appendix

1. Before taking the experiment

(1) Did you possess the following skills before you entered the experiment?

- negotiation skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Skills of explaining ideas and persuading the interviewer

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Teamwork skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Listening skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Self-organization skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Time management skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Criticism skills in a professional manner

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Communication skills with team members

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Communication skills with engineers from other specializations and consulting them (civil, electrical, mechanical...etc.)

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(2) Do you have an idea about how to manage projects?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(3) Were you learning from your colleagues in the design studio?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(4) Did you take into account the financial cost during the design in the studio?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(5) Did you have knowledge about the rules of ?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(6) Did you have an idea on how to implement the project?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(7) Did you feel the importance of the work done in the design studio?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(8) Did you have the same enthusiasm and motivation when designing a traditional studio project?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(9) Did you feel that you are ready for professional practice and do you have sufficient information about the nature of work in the labor market?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(10) Did you consider the user's behavior, personality, orientations, and cultural level in the design process?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(11) Did you have knowledge about the most important building materials and finishes in the market in terms of? You can choose more than one option

the isolating_ the durability_ the permanence_ the cost_ the quality_ Nothing mentioned_

2. After conducting the experiment

(1) Did the experience help you to acquire the following skills?

- negotiation skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Skills of explaining ideas and persuading the interviewer

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Teamwork skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Listening skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Self-organization skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Time management skills

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Criticism skills in a professional manner

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Communication skills with team members

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

- Communication skills with engineers from other specializations and consulting them (civil, electrical, mechanical...etc.)

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(2) Have you gained through experience project management skills?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(3) Did the experience help you to learn from others?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(4) Was the cost considered during the design?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(5) Do you have knowledge about local building rules and the conditions for obtaining a building permit?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(6) Do you have an idea of how to implement the project?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(7) Did you feel that the work or project you accomplished was important?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(8) Did you feel excited and motivated when designing a project for a real client?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(9) Did you feel ready for professional practice after going through the experience?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(10) Did you consider the user's behavior, personality, orientations, and cultural level in the design process?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(11) Do you have knowledge about the most important building materials and finishes in the market in terms of? You can choose more than one option

the isolating_ the durability_ the permanence_ the cost_ the quality_ Nothing mentioned_

(12) Does the budget affect the final product?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(13) Does the client's opinion affect the final product?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(14) Did you feel that there are certain restrictions on the design process? Mention them, if any

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(15) Did you feel that you had to exceed the requirements in order to achieve better results?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(16) Did the experience help you build confidence in your own abilities?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(17) Did you see that the client's requirements greatly affect the design process?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(18) Do you feel that teamwork stimulates ideas?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(19) Did you feel that teamwork gives more design solutions?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(20) Did you abandon your individual ideas and rely on the opinion of the majority during the experiment?

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(21) Did the experience help you acquire new knowledge and skills other than those mentioned above? Write them down

I agree greatly_ I agree moderately_ I agree a little_ neutral_ don't agree_

(22) To what extent do you think that the design for a real client differs from the design in the studio?