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AUTONOMY IN ARCHITECTURAL EDUCATION: A BAHRAINI PERSPECTIVE

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Abstract

Formal architectural education in Bahrain is relatively young, born only at the beginning of the twentieth century. This paper discusses autonomy in learning architecture, and the effect of using a mixed methods approach combining theoretical and practical assignments on students' performance and understanding of complex architectural concepts. The study discusses the performance and progress of 81 undergraduate students in the course of Contemporary Architecture. The paper presents the students' learning process and engagement that occurred throughout the given assignments, theorizing about how students could build on these processes to support their understanding of contemporary architectural and urban issues. The research concludes that both theoretical and practical educations are very helpful in the learning process. Nevertheless, active learning offers distinct advantages to architectural education, especially when combined with group work. The study also shows that while students were able to plan, design and construct spatial installations, they were less capable of reflecting on their projects philosophically. The results indicate the importance of practical experiences in enhancing overall student understanding of architectural phenomena.

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INTRODUCTION

Research suggests that the key to education is experience (Boud et al., 1993; Boyd and Fales, 1983; Prosser and Trigwell, 1999). In the practice of Architectural Education, the experience is considered as a producer of knowledge and is used to provide a sound rationalization of some of the real world architectural phenomena (Hammer and Acherman, 2015). Thriving teaching practices have been gradually drifting from the fifty-minute lecture that is based on the usual formal teacher-centered approaches. More active learning methods are now being used to create opportunities for interaction between the students themselves, as well as between students and their mentors. Especially in architectural education, the visual and other methods of teaching foster a strong connection between theory and practical design ideas (Viswanathan and Champa, 2014).

In architecture schools, there are no special measures and norms among mentors in evaluating and assessing student projects, and where there are, mostly they are not communicated to students. Learners should be persuaded to interact in the process of making academic judgments to help them gain greater control over their learning and therefore become more self-monitoring (Utaberta et al., 2013). This study attempts to encourage students to take increased responsibility by reducing the influence and presence of the mentor and by letting them decide how best they can learn and achieve the course objectives.

The underlying goals of this research emphasize on experiential learning to encourage students' critical reflection on their learning process and how they best understand architectural information. Another goal is to enhance students' observation and to build habits of lifelong learning. In this paper, six students outcomes through which eighty-one undergraduate students engaged for the first time in the course of Contemporary Architecture are discussed. The research incorporates a qualitative undertaking in addition to the quantitative approach to meet the challenges of the twenty-first-century learning.

AUTONOMY IN ARCHITECTURAL EDUCATION

Learner autonomy is not a new approach to education; successful students have always been autonomous. Recent research into the topic does not promote a new type of learning but rather focuses on perusing independent learning as an ultimate goal (Little, 1995). The optimal goal for education is to generate lifelong, self-directed learners; however, many current educational processes propagate dependency rather than create self-direction. Just as the dependency is learned, being an autonomous learner can also be taught, to both the student and the teacher (Grow, 1991). Training students to become independent will require equipping them with the skills needed to learn more efficiently without the constant intervention and presence of a tutor. The teacher's role in autonomous education is not just to transmit knowledge but also to assure students take greater responsibility for their education (Boud, 2005).

A lot about being autonomous is also about the learner's ability to integrate the knowledge learned in the formal classroom with real life problems. This correlation has been a major concern in educational psychology, educational theory and curriculum development (Barnes, 1976; Bruner, 1974). In 1999, the RIBA called for a redefinition of the first knowledge and know-hows required by architects to work successfully in a complicated and rapidly changing world (The Royal Institute of British Architects, 1999). One of the interpretations of the redefinition is the belief that for students to embrace the inevitability of change, their abilities to adapt life-long learning should be enhanced by equipping them with the motivation and

skills needed for self-directed and independent learning throughout life (Webster, 2005). Thus, contemporary architectural education has drifted from the emphasis on providing students with a particular set of skills to being outcome based using student-centered education (McAllister, 2010; Savic and Kashef, 2013).

The standards of contemporary architectural education were introduced by some architectural courses initiated by the Bauhaus school. Since then, project-based design studios have been the backbone of most architectural programs in the world (Salama and Wilkinson, 2007). Today, design studios are where students learn to "think architecturally." In the studio, students have the main responsibility for figuring their way through the design problem, and the mentor's role is mainly to ensure that they do not drift too far off-course (Maturana, 2014). Due to the relatively high degree of autonomy in the design studio, students, even capable ones, are often fearful of the design process and feel they have limited control over it (Ledewitz, 1985, Salama, 2016). There is, thus, no doubt that the design studio is the most autonomous learning environment in architectural schools around the world. Most of the recent studies in architectural education focus on the design studio culture (Ashkan, 2016; Choi and Kim, 2016; Gaber, 2014; Maturana, 2014; McAllister, 2010). This research, however, focuses on other courses that are supplementary to the design studio. This study emphasizes how those supporting courses could, similarly to the studio, bear a higher degree of autonomy and focus on being outcome based. The research also attempts to investigate whether students of architecture prefer to be self-directed learners in those courses.

Research shows that the academic social climate is usually higher in design studios than in regular lecture classes in social connections, students' involvement, teacher support, order, and organization; while in general classes, social climate measures are higher in teacher control and the orientation of learning material (Davidovitch and Casakin, 2015). Also, the research confirms that the interactive educational system in the design studios caters for integration between cognitive and behavioral skills that are necessary for practicing architecture (Savic and Kashef, 2013); this reaffirms the need to test the incorporation of some qualities of the design studio into other courses in the architectural program.

Mostly, studio teachers receive no training; there are no guidelines for teaching design, and they should rely merely on what they learned as students and on their instinct. The technique of instruction used mostly in design studios is the criticism of each student's efforts at synthesis in relation to the course objectives (Attoe and Mugerauer, 1991). Research in the topic is steadily growing but continues to be needed to set some guidelines for teaching design. This study will add to this body of knowledge by implementing a number of methods of instruction and a new system of evaluation, which could be informative regarding student preference, and learning more about the best practice of tutoring students in design disciplines.

Active Learning

Active learning is the process of student engagement in activities that keep them mentally and physically active with projects, pushing them to reflect on individual concepts and their application. Students are encouraged to regularly evaluate their knowledge and understanding of the given concepts or problems in a particular discipline and to attain knowledge by participating and contributing (Michael, 2006). Data from many different disciplines including learning sciences, cognitive psychology, and educational psychology are now calling for the employment of student-centered, active learning educational systems.

There is a growing body of knowledge within teaching communities that supports and validates the adaptation of those new approaches to teaching. Mentors in different disciplines should too become learners in the classroom and begin to modify their teaching methods to employ attitudes that foster active learning and match the needs of students and course requirements with their teaching styles and personalities (Michael, 2006). This research will examine the benefits and students' acceptance of such approaches by engaging them in different assignments with varying levels of activity and autonomy.

While everyone has their own learning style, research claims that the best learning methods for architectural students include visual and real world context followed by verbal information. Studies also show that students of architecture are most satisfied when there is an optimal interaction between them, their mentors, and real-world problems, and also when making their decision about how best they can learn (Brazley, 2014; Gaber, 2014). When knowledge is offered before an opportunity to apply it arises, research claims that knowledge cannot find a conceptual scheme in the students' mind to reside (Gelernter, 1984). Studies suggest that students learn the technical skills necessary for their fully rounded education more efficiently and incorporate them into the architectural design process when the skills are taught on an as-needed basis during an ongoing project (Allen, 1984). Active learning is therefore said to be crucial in creative and sophisticated majors like architecture (Gaber, 2014). This study will investigate this thesis by reflecting on the learning process of a sample of undergraduate architecture students at Bahrain University.

Finally most, if not all, of the research on the topic of active and autonomous learning and architecture relates to western and eastern countries with little to no focus on architectural education in the MENA or the Arabian Gulf regions. This research attempts to fill this gap in the literature by addressing the challenges of teaching and learning architecture specifically in Bahrain.

METHODOLOGY

The research uses a combination of quantitative and qualitative methods. This study analyzes data from a survey administered to 81 undergraduate students enrolled in the BSc Architecture program for the first semester of the academic year 2016-17 at the University of Bahrain and assesses their performance and the quality of their submitted work in the course of Contemporary Architecture. Theoretical lectures were scheduled on three consecutive days each week. Each section attends once a week, therefore, the lecture content changes weekly and is repeated three times during a week. Students who were not able to attend the lecture on their given timing for any circumstances were allowed to show up in any of the other timings during the week to ensure that all students are present in as many lectures as possible.

In line with the hypothesis that passive learning by listening to lectures is not the best way to attain optimal education (Viswanathan and Champa, 2014); also, to investigate the hypothesis which suggests that when learning while applying, the student can recall the information given for a longer time and is able to later use the taught knowledge, expertise and competence practically (Viswanathan and Champa, 2014), active methods were applied in the class to engage students in small exercises relating to the topic of the lecture. The lectures usually begin with a general principle or theme related to Contemporary Architecture and eventually goes into detail with its applications, examples and case studies. Several exercises were used in the form of competition between groups at least once every lecture to gain students' interest and to ensure that the information has set and can be effectively recalled.

Research shows that students' performance can be evaluated against measurable objectives that relate the obtained knowledge and skills to performance expectations and real-world architectural phenomena (Savic and Kashef, 2013). The students' assignments were of varying levels of activity and autonomy, but mostly put more responsibility on the students for self-learning than the conventional learning approaches. The submitted work included:

1. Research paper (Weeks: 1-2): Individually, students were asked to write a research paper of approximately 1000 words (excluding references) on the topic of "Meaning and spatial character of Contemporary Architecture". Students were asked to support their argument with examples of international, regional and local contemporary architects, discuss their projects critically and analyze their attitude to Contemporary Architecture. They were also asked to make a summary of 150 words and a reference list.

2. Term project (Weeks: 3-11): The project was designed in a way to allow students to experience a relatively high degree of autonomy in a low-stress non-classroom setting by creating a partnership between students, faculty mentors, and their physical environment and thereby move beyond the goal of learning by spoon-feeding in the classroom. In groups of 5-7, students were asked to design a temporary spatial installation on the theme "Present spatial concepts and contemporary urban spirit". Learning with others is motivating and nurtures the student's self-confidence and self-efficiency. It is also an important part of active learning (Viswanathan and Champa, 2014). Installations were located within the campus area. By setting themselves on campus, students built a connection that they could later translate into a spatial project. Students were asked to illustrate in their installation, spatial concepts that are driven from the first assignment and lectures, trying to interpret them in a way as to provoke visitors and passersby to reflect on certain pressing issues related to contemporary city and campus life. The submission requirements for this assignment were A. a sketchbook illustrating the development of the concept, design ideas and construction details of the installation; B. a picture scroll showing the progress of the installation; C. the constructed installation.

3. Lecture Quizzes (20 Minutes): After each lecture, students were asked a question that summarizes their understanding of the theoretical content of the lecture. Students were then asked to answer the question individually on a piece of paper and submit it to the instructor. Solving a live example and giving solutions was very common throughout the lecture quizzes as it is a preferable learning alternative (Viswanathan and Champa, 2014). The instructor then collects all quizzes for each student in one folder with the student name and ID. Folders were then returned to students on the day of the midterm exam with their question papers.

4. Midterm (Week 10): As the term project, the midterm was also designed in a way to allow students to experience a relatively high degree of autonomy in a low-stress non-classroom setting. Students were responsible, on the day of the examination, for picking up their question and answer sheets in addition to a folder containing their lecture quizzes from the academic department. The department secretary kept a log with students' signatures to monitor students' arrival and the timely submission of completed exams. Students were then free to answer the exam wherever they wanted within the campus boundaries. The exam lasted for two hours and included three essay questions from which students should answer only two. The use of sketches to support the student answers was a must.

5. Final exam (Week 18): Held in a hall with formal, strict invigilation system, the exam comprised of five questions, each question addressing one or more of the course objectives. The questions varied in their style: essay, true/false, short answer, list question, and sketching.

6. Bonus assignment (Two weeks): Students were given the freedom to choose the type of bonus task they wanted to submit to enhance their grades. Awarded grades varied between an extra 3-7%: 3% was assigned when the work showed average effort and some development of relevant analytical and interpretive skills; 5% was awarded when the work showed good effort and development of related analytical and interpretive skills; and 7% was awarded when the work showed exceptional effort and high level of development of relevant analytical and interpretive skills.

The survey, given in January 2017, used Likert scale questions and open-ended questions to address the research: students' understanding and enjoyment of the course materials; the efficiency of the various teaching methods used; benefits of active learning; students anatomy; and best practices for architecture students' acquisition of knowledge in Bahrain. Students' performance and the quality of their submitted work were analyzed using Ordinal variables and were rated on a scale of "Outstanding", "Superior", "Good", "Satisfactory", "Low pass, but certifying" and "Failure" with numerical values of 0, 1, 2, 3, 4, 5, 6 (see Table 1).

The students completed the survey during the last week in the semester over the Internet using their smartphones in a classroom setting on three consecutive days, depending on the day on which their section took place. In the three separate sections, 81 undergraduate students completed the survey for a completion rate of one hundred percent (100%).

Table 1. Students' performance evaluation scale based on a holistic attitude in the evaluation. The scale adopts a combination of grading systems: the six points, eleven points, the 1-2-3-4 system, and a grade interpretation system proposed by (Utberta et al., 2013).

Table 1: An example of a table (Source: Author).

No.	Scale	Letter Grade	Percentage	Interpretation
1	Outstanding	A	90-100	Exceptional Attainment of all course objectives, showing complete and comprehensive understanding of the course content, with the development of relevant skills and intellectual initiative to an extremely high level.
2	Superior	A-	87-89	Clear Attainment of all course objectives, showing complete and comprehensive understanding of the course content, with the development of relevant skills and intellectual initiative to an extremely high level.
3	Good	B+	84-86	Substantial attainment of most objectives, showing a high level of understanding of the course content, with the development of relevant analytical and B 80-83 interpretive skills to high level.
		B	80-83	
		B-	77-79	
4	Satisfactory	C+	74-76	Sound attainment of some major course objectives, with understanding of most of the basic course content and the development of relevant analytical and interpretive skills to a high level
		C	70-73	
		C-	67-69	
5	Low Pass, but certifying	D+	64-66	Some attainment of a range of course objectives, showing a basic understanding of course content with the development of relevant skills
		D	60-63	
6	Failure	F	<60	Few or None attainment of course objectives, showing limited understanding of course content with minimal development of relevant skills.

Analysis of Data

The survey can be summarized as follows: the average student was a twenty-two-year-old Middle-Eastern (17 male and 64 female) who goes to school full-time. 58 % of the students were taking the course as per the degree program. The rest were behind schedule. Only 7.4% of the students delayed taking the course for more than two years and the eldest student enrolled in the course was delayed by five years. This delay is not a surprise since students were discouraged by their colleagues from taking the module due to its reputation for having substantial theoretical content and its association with low grades in the past few years. 79.3% of the students believed that the course had stimulated their interest in Architecture and 80% of the students showed an overall satisfaction with the course materials, delivery methods and outcome. The average overall grade in the course was 82% (B), which according to the scale in Table 1 is “Good.”

The theoretical and practical assignments

More students were satisfied with the level of the theoretical assignment than the practical, being not too hard or too easy. Nevertheless, students preferred the latter and believed that they learned better when involved in a practical task. Only 13.6% of the students thought that they learned better from the theoretical assignment. 42.5% of the students did not enjoy the theoretical task, while only 4.9% of the students did not enjoy the practical assignment. The students struggled to finalize their installations because of time constraints and the workload from other courses. Although the majority of courses in the Architecture Program require a term project of a practical type, the students collectively thought that their previous education prepared them to undertake theoretical assignments, but not practical ones. This could be attributed to the fact that students were never involved in an assignment that requires designing and building of 1:1 scale models. The average grade for the theoretical assignment was 70% (C, Satisfactory), and the average grade for the term project was 93.5% (A, Outstanding).

The Midterm Exam

Collectively, the students thought that the exam was of reasonable length and level. 75% of the students thought that they have learned from the midterm exam and 70% of the students enjoyed it. 83.5% of the students believed that not having to take the exam in a hall helped them to perform better. Only half of the students felt that they had the solid graphical, language, and theoretical education and training that prepared them to take an essay type of an exam that incorporated sketches. Consequently, 49% of the students were satisfied with their grades. Overall, only 14% of the students were not pleased with the exam. The average grade for the midterm exam was 72% (C, Satisfactory).

The Bonus Assignment

The bonus assignment was not compulsory. Only 37% of the students undertook the assignment. Mostly, students agreed to take the assignment to enhance their grades. Those who didn't were either satisfied with their semester performance grades or did not have the time to take the assignment. Almost all of the students who did not take the bonus assignment expressed their interest in putting the extra effort if time had permitted them and they had less unfinished work for other courses. Wanting to learn more about contemporary architecture was a motive for only a few of the students to undertake the extra workload.

Almost all of the students were satisfied with the unstructured nature of the bonus assignment except for only 1.3% who preferred structured assignments. Most of the students believed that they could learn and achieve better when the type of assignment was left for them to decide. 85% of the students wanted to be given the right to choose the kind of assignment they will do in the future. The submitted bonus assignments included essays, research papers, sketchbooks, posters, paintings, videos, and installations. The average bonus grade was +3.8%.

Final examination and overall evaluation

Although the midterm exam was an open book type and the final exam was a formally closed book exam, scores of the students in both exams were relatively similar. The average grade for the final exam was 77% (B-, Satisfactory) and for the midterm 72% (C, Satisfactory). Overall, and by the end of the semester, 88.5% of the students believed that they know what contemporary architecture is and feel confident to explain it to others. 85.9% of the students felt that they can critically categorize the different types of Contemporary Architecture and 77% were inspired by various Contemporary Architects and Projects and can confidently explain some of the recent theories and projects with details.

DISCUSSION AND CONCLUDING REMARKS

Student feedback is valuable and should be sought for in other courses in the architecture program. The researcher learned from the application of different learning processes at least as much as the students. This supports (Gaber, 2014) conclusion on the importance of lifelong constant education for students of architecture and their mentors. Asking students questions have also stimulated their interest in knowing their learning further. Students can provide much information on how they think and learn. The literature suggested a lack of guidelines to teaching design oriented disciplines (Attoe and Mugerauer, 1991). The findings of this study contributed to filling this gap by providing insight on the students learning preference. While the autonomous nature of the design studio has been discussed in the literature (see Allen 1984; Attoe & Mugerauer 1991; Ledewitz 1985; Nicol & Pilling 2005; Salama & Wilkinson 2007), less attention has been given to other supplementary courses in architecture programs, particularly in the Arabian context. This study investigated the benefits of using a mixed methods approach to teaching architecture in such courses to undergraduate students in Bahrain. The evaluated assignments in this study varied in their level of activity and autonomy.

The research concludes that both theoretical and practical educations are very helpful in the learning process because mentors need a variety of instruments to deliver different types of information to students. Active learning offers distinct advantages to architectural education, especially when combined with group work: longer reclamation of information, social connectivity and interactivity, personal and individualized learning, and the cultivation of self-confidence and self-efficiency. Students of Architecture learn more and make better grades in active learning than in traditional learning methods. The findings affirm that students of architecture are satisfied the most when there is an optimal interaction between them, their mentors and real-world problems, also when making their own decision about how best they can learn (Brazley, 2014; Gaber, 2014).

Most students thought that active learning was useful and more enjoyable, which adds to the body of knowledge within Western teaching communities that supports and validates the adaptation of active, project based approaches to teaching architecture. This study suggests

that such approaches are also preferable in the Bahraini context. Barriers to active learning in architecture included: time constraints, especially with the overload of work from other modules; miscommunication; and the lack of group work and leadership skills. Students said they learned best with active learning, followed by theoretical assignments that incorporate a high degree of autonomy.

Students liked the quizzes that tested their understanding of theoretical lectures. Recalling the information shortly after it's given with the students' own language facilitated a deeper understanding of the topic discussed. Also, using the students' notes in the midterm exam to recall information was a successful approach to conducting an effective open book examination. The literature suggested that when knowledge is offered alongside an opportunity to apply it, knowledge finds a conceptual scheme in the learners' mind to reside (Gelernter, 1984). The use of quizzes that incorporate live examples and giving solutions in this study helped students perform better and have a deeper understanding of the topic.

Students' learning in architecture is associated with meaningful hands-on processes that require some physical work, similar to the spatial installations. But too many practical steps submerge the project into craftsmanship and technological shortcomings that might not lead to desirable outcomes while also compromising the student's ability to reflect on their projects philosophically. This raises the question of, how can we balance the complex process of designing, constructing with critical analysis of the theoretical problem in hand? Finally, this study sheds light on the need to focus on particular measures and assessment strategies that will assess students' critical thinking and achievement of the course outcomes.

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