THE CONTRIBUTION OF INTERIOR DESIGN STUDIO IN PROMOTING SUSTAINABLE DESIGN IN BAHRAIN

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ABSTRACT

Nowadays, Bahrain like many other cities faces different challenges such as a high percentage of pollution due to intensive use of energy, climate change and dense urban areas which influence human comfort and well-being. As a result, sustainability is an approach to alleviating these problems and improving the built environment and human health and wellbeing. Consequently, the education system is an approach which affects societies in achieving sustainable development, especially in the fields of architecture and interior design. Although interior design studios as a basis of the undergraduate interior design and architecture education have a unique learning environment for solving different environmental problems, unfortunately, sustainability is not considered in these studios. Therefore, this research argues the significant role of an interior design studio in promoting students’ awareness and understanding of sustainable design. Few articles have been published addressing sustainability within design education. Case studies of three interior design programs at three universities in Bahrain are presented, namely: Ahlia University (AU), Kingdom University (KU), and Applied Science University (ASU). The analysis of three program curricula revealed that there are no sustainable core courses. This research divulges on the net in reviewing the interior design curriculum to incorporate further sustainability studies and emphasizes that sustainable design should be started at lower levels in the curriculum to provide students with the sustainable design background. In addition, this research will present a model that integrates sustainable concept in interior design studio which is essential for professional practice.

Keywords: Interior design, design studio, sustainable design, pedagogy method, sustainability, curriculum.

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1. INTRODUCTION

“Through education and lifelong learning we can achieve lifestyles based on economic and social justice, food security, ecological integrity, sustainable livelihoods, respect for all life forms and strong values that foster social cohesion, democracy and collective action.” [1].

Generally, traditional buildings all over the world witnessed sustainability practice as these buildings were responded to the environment, climate, privacy, and human comfort. As a result of the industrial revolution, a new building design became less responsive to the surrounding environment which influences our planet [2]. Similarly, interior design and architectural education followed these technological advancements that focus on the technological side of design and ignoring the traditional design knowledge [3]. Different studies in different countries conducted on interior design students showed that the students do not have adequate environmental knowledge. Therefore, for an interior designer to be effective to protect the environment they need to gain knowledge and skills in environmental issues [4].

Therefore the need to implement sustainable education in interior design has become essential as it provides an understanding of the interior environment and problems that affect our lives. The interest in sustainability in interior design increased in North America and Europe as it is integrated in interior design education mainly in design studios, classes and lecture courses as the skills, knowledge, and awareness interior design students gain during their study is important in producing environmentally friendly interior designs [4-5]. Moreover, most of the interior design programs who seek accreditation such as CIDA to improve their standards must have environmental studies included in their curricula [4]. In addition, the integration of sustainable values in the undergraduate education will be a powerful force in forming environmental ethics for students to understand the interrelation between a building and the environment and to apply these ethics in their projects [6].

Sustainability education prepares students for all environmental challenges such as air pollution, global warming, and increasing the urban heat island (UHI). According to Sterling he stated “a change of educational culture, one which develops and embodies the theory and practice of sustainability in a way which is critically aware” [7]. On this occasion, all the institutions of higher education must incorporate environmentally responsible design into the educational structure to build up local expertise capable of solving the environmental issues and move toward the attainment of a sustainable society [8-9]. Finally, the aim of this research is to investigate sustainable design in relation to interior design education and how to increase students’ awareness of sustainable design.

1.1 Aims

The main research aim is to investigate the possibilities to enhance sustainable design education through the design studio. This research is designed as a basis for further investigation on the role of a design studio in satisfying sustainable design.

Principles of Sustainable Design

The following sustainable design principles are determined to eliminate the negative impact of the interiors on the environment:

- Energy- is the main principle of sustainable interior design. Climate data improve the indoor environmental quality (IEQ) such as using natural lighting and ventilation system (passive design) and reduce energy consumption represented in HVAC system (active design).
• Materials- use eco-friendly, durable and natural materials in furniture and finishing that reduces waste and toxic gas emission like formaldehyde and radon to improve buildings’ indoor environment and occupants’ health and wellbeing.
• Technology- use building automation and humidity sensors that control lighting and HVAC system to provide a thermal comfort.
• Water- reuse of rain water and gray water in interiors.

2. RELATED LITERATURE
The design studio courses are a core of an interior design program that has a practice-based profession makes it different from other educational programs [9]. Interior designers are not only dealing with aesthetic aspects that deal only with furniture, materials and colour for a building interior, they are responsible in proving a healthy interior environment for its occupants [10-11]. According to El-Zeiny, sustainable education is “the educational process dealing with man’s relationship with his natural and man-made surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology and urban and rural planning to the total human environment” [12].

Hence, design studio projects cannot teach students sustainable practice without the information from theoretical courses that encompass sustainable notions in the curriculum. Likewise, different interior design departments and architecture schools have some theoretical courses in green design and sustainability in their curriculum with no integration of these courses in design studios which make it difficult to apply sustainable design in professional life [13]. However, interior design teaching has failed to integrate and apply the knowledge gained from lecture based modules in a design studio project as a result of teaching methods, instructional tools, and the curriculum structure [14-15].

In addition, the main obstacles in teaching and integrated sustainability in the curricula are the lack of trained academic staff, textbooks and lack of government awareness [12]. Moreover, the disconnection between the theoretical courses and design studio courses cause a failure to transfer relevant learning, skills and understanding to design projects [15].

In order to overcome these problems new teaching methods in design studios needed from instructor rather than the conventional design approach, e.g. labs, environmental examination tools, software, and simulators provide an effective learning within the framework of the design studio course. Hence, introducing sustainability into design studio is crucial that enable graduates to assess the environmental risks and make sustainable decisions in their design process [14, 16]. In addition, different studies found that sustainability was integrated in studio classes in the United States at the freshman, sophomore, junior, and senior levels [14]. Therefore, the curricula adjustment should include building materials, renewable energy, and environmental aspects like heat transfer, day-lighting and air movement [16]. They added the whole curricula should be reviewed to integrate sustainability in all the modules of interior and architectural education curricula. She added sustainable education is to be divided to core modules that establish the baseline to the different sustainability aspects and specialized elective module building on them.

3. METHODOLOGY
This research reviews different literature on sustainability education. Also, it argues sustainable interior design education in Bahrain? A qualitative and quantitative data collection was employed in this research. The curricula of design studio in three private universities in Bahrain, namely the Ahlia University (AU), the Kingdom University (KU), and the Applied
Science University (ASU) are examined in this research show their coverage, direction and emphasis. An interview for faculty members conducted in the three departments concerning sustainability. Secondary data were obtained from university publications (handbooks and course synopsis) obtained from the three departments. An online survey questionnaire for one hundred twenty (120) students in the three (3) departments was distributed using Google Drive. The questionnaire consisted of five (5) main parts: sustainability in interior design curriculum, sustainability knowledge includes (energy consumption, recyclable materials, renewable energy resources, and indoor air quality), Instructors’ interest in sustainability, the best way to learn sustainable design, and sustainable development in universities. Ninety two (92) of the respondents answered the questionnaire, and the analysis of the data was done using SPSS software.

4. RESULTS AND DISCUSSIONS

4.1 Design studio curricula in the three universities

Curriculum of the Interior Design Studio at Ahlia University (AU)

The design studio courses at Ahlia university are taught in 2 (two) academic years (3rd to 4th year) in each semester. A faculty member is appointed to teach the students using different methods such as research, case studies, and site visits. Below the course descriptions for design studios which can be seen at Ahlia university website and catalogue [17].

- **INTD 300: Design Studio I (1-4-3)**
  The aim of this course is to improve their creativity through different exercises which include spatial organization, anthropometrics and circulation.

- **INTD 310: Design Studio II (1-4-3)**
  The emphasis of the design projects is on residential design projects.

- **INTD 400: Design Studio III (1-4-3)**
  Design studio III comprises major and minor projects that involve hospitality and entertainment projects such as restaurants, hotels, and shopping malls.

- **INTD 410: Design Studio IV (1-4-3)**
  The emphasis of this studio is detailed structural interiors, furniture, false ceiling, and lighting.

Curriculum of the Interior Design Studio at Kingdom University (KU)

The design studio courses at Kingdom university are taught in 3 (three) academic years (2nd to 4th year) in each semester [18].

- **INTD 211: Interior Design Studio I (1-6-4)**
  The focus of this studio is on human dimensions, scale, safety, and circulation of interior spaces.

- **INTD 212: Interior Design Studio II (1-8-5)**
  The emphasis of this studio is on users’ need, space restructure, the use of natural lighting and ventilation, and materials of a medium scale office project.

- **INTD 311: Interior Design Studio III (1-8-5)**
  This design studio deal with hospitality environments project that focus on users’ accessibility, economic, social and cultural context.
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- **INTD 312 (Interior Design Studio IV (1-10-6)**
  This studio focuses on commercial design project with emphasis on defining economic, cultural context and environmental challenges with an application of advanced technologies in construction and materials.

- **INTD 411: Interior Design Studio V (1-10-6)**
  This studio deals with large scale interior design project of public building integrates functionality, aesthetic values, appropriate technologies and materials, codes, social and environmental sustainability.

**Curriculum of the Interior Design Studio at Applied Science University (ASU)**

The design studio courses at Applied Science University are taught in 3 (three) academic years (2nd to 4th year) in each semester [19].

- **1212211: Interior Design 1 (1-4-3)**
  This course focuses on residential buildings’ circulation, furniture arrangement, lighting, and materials.

- **1212212: Interior Design 2 (1-4-3)**
  This course introduces students to multi-function residential buildings.

- **1212313: Interior Design 3 (1-4-3)**
  The emphasis of this studio is on shopping centres, shops, clinics, and offices.

- **1212314: Interior Design 4 (1-4-3)**
  This course presents a study of leisure projects and cultural centres such as theatre halls, clubs, and monuments.

- **1212415: Interior Design 5 (1-4-3)**
  Design studio 5 deals with public buildings such as railway stations, airports and universities.

**4.2. Results of the three design studio Curricula**

In general, teaching in design studio is different from theoretical courses as instructors in design studios guide students through their design projects. The design studio courses in the three programs are a hybrid course which combines both theoretical and practical part as it is clear from the number of hours in the course synopsis for each course and the credit hours. For example (1-4-3) means one (1) hour theory lecture every week, four (4) hour studio class every week and three (3) means the credit hours for this course. The three programs have the same assessment method which depends on jury system as students present their projects to a jury panel. The evaluation criteria depend on meeting project requirements, graphic communication (plans, sections, elevations, Material plans, and 3D perspective), oral presentation, and creativity.

Obviously, the education curriculum of interior design for the three programs almost devoid of sustainable design courses except one theoretical course at the Kingdom University and the elective courses in the three programs has no courses relevant to sustainability. Interestingly, none of the faculty members in the three programs specialized in environmental or sustainable design. In addition, the design studio projects are not geared toward sustainable design as it is cleared from the synopsis of the design projects.

Unfortunately, there is no place in the curriculum of interior design in Bahrain for sustainability courses. This is apparent in the absence of theory courses and design studios. Thus, the curriculum in the three universities requires restructuring to meet the need for
sustainable development to reduce the negative environmental impacts and improve community healthy living.

4.3. Respondents

- The curriculum

When the students were asked about having classes in sustainability nearly (97.8%) of the respondents in the three programs answered "No" given in Figure 1.

![Figure 1 Sustainbility in the Curriculum](image)

- Knowledge in Sustainability

The knowledge questions were analyzed as Yes, or No. Only 63% of respondents give correct answer concerning knowledge about recyclable materials. Concerning alternative energy 43% of the participants answer the question correctly. 18% of the responses gave a correct answer when they asked about energy efficient products. Nearly 28% of the participants answered correctly about the products that release pollutants to interior spaces given in Figure 2.

![Figure 2 Knowledge in Sustainability](image)

- Instructors’ interest in sustainability

Nearly 81% of the respondents show their interest in sustainability, however, the respondents with over 30 years of experience show little interest in sustainability given in Figure 3. Therefore, instructors need to increase their interest in sustainability by attending different seminars, workshop, and reading related books and scientific papers, and attending conferences.
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Figure 3 Instructor’s interest in Sustainability.

- Sustainable development in universities
  At least 45% of the students at Ahlia University believe that sustainable design should be introduced by universities, compared to 36% of the students in the Kingdom University, and 19% at the Applied Science University given in Figure 4. Therefore, the student’s tendency concerning sustainable design is to modify the curriculum content rather than adding new courses.

Figure 4 Sustainable Developments in Universities.

- Best way to learn sustainable design
  When the students were asked about the best way to learn about sustainable design, (39%) of the students in the three programs agreed that design studio and its critiques stimulated their interest in sustainable design, this was followed by the internet (31%), reading (8%), research (6%), guest lecturers (10%), and field trip (6%) given in Figure 5.

Figure 5 Best methods to understand Sustainable Design.
5. INTEGRATE SUSTAINABLE PEDAGOGY IN DESIGN STUDIO

The sustainable design studio aim is to maximize the quality of the human interior environment and alleviating negative consequences. The pedagogical process in design studio is based on face-to-face classes between instructor and students, all of whom can learn from each other. This process provides a discussion environment beyond conventional lectures which is less productive as the students get bored quickly duration the lecture [8, 11]. The teaching of the studio needs to apply the skills and knowledge gained from different courses in the curriculum to produce a sustainable interior space.

Usually, students express their ideas and thoughts through sketches, drawings and research which later developed to produce the final project [13]. Generally, the first stage of the studio is theory-based on intensive research and lectures alongside the design project work. Ideally, different lectures by practitioners invited from different background in sustainability help both students and instructors about sustainability. In addition, work collaboratively with other students in carrying out and presenting research about sustainability helps cooperative learning rather than conventional lectures. Moreover, different field trips to actual project building facilitate students understanding about sustainable principle and applications in the building design and connect students with information in response to a project design problem [8].

Therefore, practitioners in the field invited to share their knowledge and ideas that help students to gain a better understanding of their work and speed up rate of gaining knowledge and work [20]. In addition, the second stage is practically based for individual design projects. In this stage, students develop their design to meet the project needs and present it in 2D and 3D drawings using face to face tutoring. During the project development the instructor meets students individually or in groups and gives critiques and comments that help in the project development [10].

6. SUGGESTIONS

- Interior design curricula should be updated and upgraded to include sustainability to cope with the environmental impacts.
- Integrate sustainability into interior design education through both theoretical lectures and design studios varying from climatic issues to building materials, building technologies, renewable energy resources within the appropriate level.
- Universities have to hire expertise in sustainability to encourage students to be innovative in their design projects.
- The main constraint against initiating sustainable courses is the limited number of credit hours. To overcome this difficulty, it would be helpful in spreading sustainability among all design studios [16].

7. CONCLUSION

Sustainability of the interior environment is very important as people spend the majority of their time in indoor spaces. The capability of an interior designer to apply sustainable design in professional practice depends on the knowledge and skills he/she received during his/her education. The result of this research shows a clear absence of sustainable courses from the curricula in the three interior design programs. It is also clear from the survey that the students in the three programs lack the knowledge in sustainability.

For sustainability to be effective it should start at early levels in the interior design curricula and there should be a balance between theoretical and practical courses. As design studio is the basis for interior design education, it is essential that the studio projects should
be supported with other theoretical courses. Reviewing different literatures most of the scholars recommended different sustainable courses to be included in the interior design curricula at early levels that support the knowledge and skills of sustainable design and enrich the professional practice, for example, Climatic Responsive; Environmental Systems and Construction; Building Materials and Technology; Design Studios that integrate sustainable principles \[4, 8, 12, 16\]. Therefore, the Higher Education in Bahrain must enforce sustainability into the curricula of all the higher education institutes to suit the peculiarity of Bahrain's environment and to increase students and community awareness.

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REFERENCES


