

# Integration of Sustainability in Interior Architecture Education

Asst. Prof. Dr. GOZEN GUNER AKTAS  
Interior Architecture and Environmental Design  
TOBB University of Economics and Technology  
Sogutozu cad. No:43 Sogutozu, Cankaya, Ankara  
TURKEY  
gaktas@etu.edu.tr

*Abstract:* - This study aims to discuss the integration of sustainability in the education of interior architecture and interior design for the future of more sustainable interiors. Different methodologies integrated with design are introduced. Interdisciplinary, transdisciplinarity, self-regulated learning systems discussed to increase the contribution of sustainability in interior architecture/ design education.

*Key-Words:* - Sustainability, Ecological, Design, Interior Architecture, Education.

## 1 Introduction

The concept of sustainability became a subject of discussion after the final report of the World Commission for Environment and Development in 1987. Brundtland report provided the basis for convening of the United Nations conference on Environment and Development in 1992 [18, 15]. Consequently, the importance of the subject is increasing everyday; while the world population is increasing and the overall quantity of natural resources is decreasing [1, 2]. The conflict of this century is an increase in peoples' life quality while a decrease in the overall consumption of natural resources [20].

The concept of sustainability is basically defined in the Brundtland report as thus: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [18]. Whereas the concept of 'needs' should be evaluated in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs [13].

The ongoing research being carried on the concept of sustainability has been established in three main directions:

1. The protection of the natural environment.
2. The maintenance of economic vitality.
3. The observance of specific social considerations [13].

Consequently, as it is indicated in the study by Steiner and Posch (2005), sustainability is no longer synonymous with environmental protection. The ecological question of resource management is no longer treated in isolation, but has become integrated as an important part of the comprehensive question of societal development. Moreover, the three essential dimensions of the concept of sustainability moved through:

1. Ecological
2. Economic
3. Social development

All of the three dimensions of the concept are principal for sustainable environments [13].

Interior Architecture and interior design discipline has an important role in human life. It is accepted that a human being spends 90% of its life in interior spaces. On the other hand, buildings are among the long-lasting man-made products. Hence, Interior architecture and interior design disciplines can give a great contribution to the concept of sustainability as an area directly related with the human being. This study aims to discuss the integration of sustainability in the education of interior architecture and interior design in order to achieve a permanent future for sustainable interiors. The integration of the sustainability into the design education and the interior architecture education is essential for healthier interiors and satisfied occupants for the future of the discipline [1].

## 2 The Role of Design in Sustainability

The concept of sustainability in the design field focuses on both absolute and relative improvements in regard to its ecological and social consequences in the designed item as well as in the region. On the

other hand, sustainability in the design field should be considered from an eco-efficiency and socio-efficiency point. Furthermore, the consumption habits and lifestyles of the public directly relates to the concept of sustainability in the design field [15]. The three-dimensional concept of sustainability in the study of Porter nad Cordoba (2009) can be summarized with the table 1.

Three Conceptual and Practical Perspectives on Systems and Sustainability

	Functionalist	Interpretive	Complex Adaptive Systems
Principles and Assumptions	All aspects of systems are self-evident and knowable. Linear cause and effect. All inputs, processes, and outputs may be quantified and optimized.	Meaning is subjective, socially constructed, and not self-evident. Systems and boundaries in conflict require further critical inquiry.	Densely connected networks of agents, self-organization, and emergence. Ongoing learning and bottom up evolution.
Theories	Scientific management, Hard systems theory, General system theory, Structural functionalism	Symbolic interactionism, Frankfurt School, Soft systems theory, Critical systems thinking.	Complexity theory, Non-linear systems, Complex adaptive systems.
Methodologies	Quantify all elements of the system, including intangibles. Determine mathematical linkages and cause and effect. Optimize system functioning.	Self-inquiry, self-awareness, appreciative inquiry. Dialogue and democratic debate. Surface assumptions, explore tensions between conflicting interpretations.	Build and empower learning networks and bottom up processes. Provide appropriate incentives. Monitor results and make adaptations as needed.
Strengths and Weaknesses	Precise quantification of problems and optimization of chosen parameters. Oversimplifies social and human factors and actors' subjectivity.	Layered and nuanced perspective of multiple stakeholders' views. Assumes eventual consensus and improved sustainability results.	Well suited for today's turbulent marketplaces. Shift to stewardship style of leadership. Not applicable in all systems and situations.

Table 1: Conceptual and Practical Perspectives on Systems and Sustainability[15].

On the other hand, designers play crucial roles in improving the quality of life with a sustainable touch in human life. Lifestyles of the contemporary society, aid in influencing a positive change through the creation of more responsible goods, services and spaces. As it is indicated in the IDSA (International Designers Society of America) report in 2001, designers have an enormous potential and opportunity to propose solutions that could mitigate the global ecological crisis, and use the power of design to inspire people to act for the benefit of our natural environment and to improve the quality of life of human society in the future: this should be the design challenge of our generation [16].

It is obvious that no responsible design can be achieved without a responsible designer. From the sustainable point of view it is essential to integrate design education and sustainability for the future. It is imperative that design professionals and students comprehend the potential ecological and sustainable impacts on the profession. Indeed, design education

for sustainability can help to change the future by transforming the designers of tomorrow [16].

Architecture, engineering, interior architecture, interior design and all design disciplines have a great responsibility to introduce the future professionals with the concept of sustainability and the related issues. IDSA (International Designers Society of America) report in 2001 declared that "Design will no longer regard the environment as a separate entity" and that "we, as global designers shall pursue the path of sustainable development by coordinating the different aspects influencing its attainment, such as politics, economy, culture, technology and environment" [16].

### 3 The Nature of Interior Architecture Education

Interior Architecture education and Interior Design profession is a combination of academic knowledge and practice. Knowledge transfer is essential in interior architecture education. To encompass its jurisdictional knowledge, so is the education necessary to prepare practitioners. Although this progress has been noteworthy, significant issues remain unresolved. Specifically, universal acceptance from allied professions regarding the value of Interior Architecture, and recognition of Interior Design as a discipline within the academy is apt to be reached [3].

A fundamental quality of interior design is its interdisciplinary value. Hasell (1993) is one of the many to acknowledge the contributions of academic disciplines such as "...history, behavioral studies, psychology, ecology, sociology, and architecture" to the design and study of interior space. Thus, to understanding aspects related to interior design discipline requires some understanding of allied disciplines, their theories and methods as well [5].

Interior Architecture is such a discipline that during the education process educators and practitioners, should work together. The partnership of design educators and design practitioners is essential to provide an ideal educational model. Such a partnership will transform Interior Architecture education into a state that can be utilized in the 21st century [5]. This will prepare the future designers to practice with the breadth and depth of knowledge required to solve complex interdisciplinary problems of human behavior and design. This education must prepare future practitioners to implement *evidence-based design criteria* into the

design process and thus improve the quality of the designed environment. Educators must be prepared to teach future practitioners the *value of research* that adds to the body of knowledge. Thus, the bridge between practice and education can be strengthened, in turn sustaining the profession and providing the foundation for an academic discipline [3].

On the other hand, interior architecture / design organizations have great contributions for a defined body of knowledge of interior design. This partnership appears to be driven primarily by the professional interior design organizations whose members are concerned with questions regarding regulation and licensing of the interior design profession [1].

#### 4 Sustainability in Interior Architecture Education

The concept of sustainability in the sector of construction is defined as; “the creation and responsible management of a healthy built environment, based on the efficient use of resources and on ecological principles” by Scott in 1999 [12]. Sustainability in the construction industry works for the present and future improvement in life quality [6].

Sustainability has the potential for developing environmental synergies through the coordination of economic activities among commercial or industrial enterprises. A key aspect of this design is the development of a web of enterprises connected to form an efficient and inter-dependent system, in which discarded materials and heat of processes are used as inputs to others [4].

Leading design theorists and practitioners have been debating on the question for over a decade, one of which considers “design as context” [7] where sustainability fits alongside other facets, activities and priorities of design and design education, furthermore tends to focus on single issues such as recycling, cradle-to-grave, dematerialization, etc. A proposed alternative is “sustainability as context” [7] which locate design alongside other disciplines, so instead of “trying to put sustainability into design, you put design into sustainability” see figure 1.

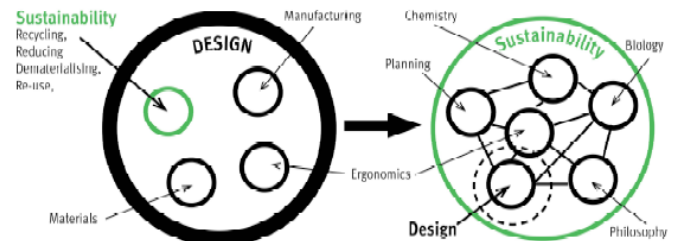


Figure 1: Adapted from “Range of possible starting points for education in design for sustainability” [7]

It is argued that truly integrating sustainability into *all* education is vital in the global effort to instigate change; the notion of ‘sustainability as context’ necessitates acknowledgement throughout the whole institution. Consider the possibility of future graduates questioning how their contributions to a project might have an impact on people, on the planet and even long-term business goals [4].

Research shows that within these linear processes the detailed design phase not only embeds the form and function of the product but also specifies 75% of resources used. Additionally, 80% of the economic cost and 80% of environmental and social impacts are influenced at this stage. Researchers argue that it is not only the traditional design process that follows such an orderly flow, but that there are “four stages of existence: introduction, growth, maturity and decline” [14]. Their argument can be related to the life cycle of the majority of furniture and products, which also progress sequentially in this “cradle to grave” linear process. Reflecting upon the notion of design as “shaping”, “serving” and “giving meaning” or as “a hinge that inevitably connects culture and nature” or as “shaping the physical details of our daily experience”[14]. Many design researchers, design practitioners and design educators assert that “designers have a direct role in creating environmental impacts” [4].

Basic principles that underlie sustainability in interior architecture / design in construction industry can be listed as:

1. Saving of existing material resources;
2. Maintenance of a clean and healthy interior environment;
3. Reduction of the embodied energy in buildings;
4. Measures regarding the diminution of heat losses;
5. Providing an optimal ratio between the surface of the envelope and the building volume;

6. Contributes to the thermal insulation of the closing elements of a building (exterior walls, floors, roofs);
7. Ensuring of adequate thermal inertia;
8. Contributes to the creation of insulating spaces between environments with different temperatures (buffer spaces in attics, basements, staircases, etc.);
9. Requires more efficient installations and equipments;
10. Provides hierarchy of spaces requiring different temperatures and their orientation in relation to the cardinal points;
11. Requires use of renewable energy sources (solar, geothermal energy);
12. Provides optimization of natural ventilation;
13. Encouragement of investments for the conservation of energy;
14. Provides an increased awareness of users, adoption of more rational building operation conditions [6,17].

Briefly sustainable interiors can be defined as; any form of design that minimizes environmentally destructive impacts by emulating and integrating with natural ecosystems can be referred to as eco-design [4]. As such, eco-design seeks to provide a framework for an environmentally appropriate system of design and management by incorporating both anthropogenic and ecological values, at relevant spatial and temporal scales. The concept of ecological design involves several key aspects, such as:

- Meet the inherent needs of humans.
- Move toward resource sustainability.
- Maintain ecological integrity.
- Emulate natural ecosystems.

Design towards an integrated web of economic and ecological activities

Accommodate the natural regime of ecological stressors and disturbances

- Eliminate natural debt.
- Protect natural habitat.
- Increase environmental literacy [6,17].

These criteria of sustainable interior spaces should be integrated with the Dynamics of interior architecture / design education:

1. Studio-type subjects which are dedicated solely to working on sustainable design projects
2. Studio-type subjects which include some projects on sustainable design but also other projects not focused on sustainability
3. Lecture-type subjects which discuss sustainable behaviors or environmentally responsible solutions

4. Lecture-type subjects which partly touch on sustainable design issues but also discuss the interrelation of other topics [16].

The three system approaches to educating for sustainability - in the study of Porter and Cordoba, (2009) can be summarized with the table 2 [15].

**Three Systems Approaches to Educating for Sustainability**

	Functionalist	Interpretive	Complex Adaptive Systems
Sustainability	Environmental concerns are variables to be managed. Top down initiatives; command-and-control management.	Raise awareness through self – reflection and appreciation of natural and other systems. Collaborative stakeholder decision-making and coordinated action.	Learning networks create sustainable value in new or existing products and processes. Productive innovations from the bottom up.
Educational Goals and Skills	Understand the inseparability of organizations and the environment. Incorporate desired parameters into system design and optimization	Improve self-understanding. Identify stakeholders and appreciatively inquire into their worldview. Revise functional plans according to collaboratively made decisions.	Ability to distinguish each system perspective. Identify sites of leverage, empower learning, and design incentives. Win trust and build consensus.
Activities and Projects	Net Impact. The Natural Step. Case study of environmental practices on campus; construct "environmental score-card" of university operations. Develop environmental improvement plan.	Develop awareness of inner and outer worlds. "Eccollaborative" activity. Interview campus stakeholder groups to inquire into their sustainability views. Revisit environmental plan and critique or revise.	Greening of Industry Network and Business for Social Responsibility. Map systems relevant to campus environmental practices. Implement a bottom up sustainability initiative on campus.

Table 2: Conceptual and Practical Perspectives on Systems and Sustainability[15].

Interdisciplinary, transdisciplinarity, self-regulated learning are the other principals that contribute to the introduction of sustainability in interior architecture/ design education [13].

#### A. Interdisciplinary

As interior architecture / design is a complex discipline that works with lots of disciplines in coordination, teaching in formation in isolated university courses is not possible to capture the complex nature of the concept of sustainability and its implications. Hence, a paradigm shift towards a holistic view involving systems thinking is needed [10]. A wide variety of competences are needed to develop a holistic concept of sustainability and to be able to contribute to a system change towards sustainable development. Especially social competences of students such as effective communication, presentation skills, teamwork, etc., frequently need to be improved. Moreover, methodological competences like traditional project management techniques and more complex planning and decision-making methods need to be imparted. In this way, students also learn how to learn, and

this should be a fundamental goal of any education [13].

### B. Transdisciplinarity

While the principle of interdisciplinary calls for cooperation across different subjects and disciplines, transdisciplinarity involves intense interaction between academics and practitioners in order to promote a mutual learning process between them. It is not possible to effectively research or teach sustainable development of society without interacting with society. The different kinds of knowledge and competences need to be brought together in a way so that barriers to innovation can be overcome. By combining analytical knowledge and systems understanding with practical observation and experience, and linking these to society's risk perception and demands, a joint problem-solving process amongst science, technology and society can be achieved [13].

### C. Self-regulated learning

In Self-regulated learning, learners are metacognitively, motivationally and behaviorally active participants in their own learning process and they self-generate thoughts, feelings, and actions to attain their learning goals. They therefore find themselves in a position where they are forced to recognize the consequences of their own actions, and may no longer attribute success or failure to forces beyond their control. In this way they can see themselves as owners of their behavior [11]. This concept of self-regulated learning can be viewed as socially sustainable in the sense that it empowers learners to take their learning into their own hands [13].

## 4 Conclusion

Interior architecture and interior design in the field of construction sector should develop some sustainable approaches in their design field. In the concept of sustainability in built environments, interior spaces have a great significance as they are the main shelters of the individuals. Whereas human beings spend 90% of their lives in interior spaces. Using the basic concepts of ecological and green design requirements interiors will have a great contribution to the concept of sustainability. As buildings are one of the long-life man-made productions. Interior finishing material selections and the interior surface applications like green walls can make a great contribution to the interiors, occupants and sustainability as well.

To contribute to the concept of sustainability in interior Architecture discipline, it is essential to integrate sustainability into interior architecture/design education. This study aims to

discuss the integration of sustainability in the education of interior architecture and interior design for the future of more sustainable interiors. Different methodologies integrated with design are introduced. Interdisciplinary, transdisciplinarity, self-regulated learning systems discussed to increase the contribution of sustainability in interior architecture/ design education.

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