

# REFLECTIONS ON DESIGN FOR SUSTAINABILITY- A VIEW FROM A DISTINCT POINT AND THE ROLE OF INTERIOR DESIGNER

**K Ioannou-Kazamia<sup>1</sup> & J Gwilliam<sup>2</sup>**

(1) School of Humanities Social Sciences and Law, Department of Architecture, University of Nicosia, Cyprus (2) Welsh School of Architecture, Cardiff University, UK

## ABSTRACT

This paper explores the term “Interior Design” and in particular the relationship of the interior design profession with its direct and indirect impacts on the environment. Through a brief analysis, we explore this close relationship, establishing opportunities designers have to promote environmental sustainability. This work goes on to elucidate the role of the interior designer in the delivery of sustainability, providing examples from literature. Further, the process of design, within a context of sustainability is examined, from the design purpose, source of inspiration and subject through to the selection of materials, method of construction and finally, the realization of the idea.

Finally, the paper expands the relationship of the interior design profession to the wider scope of social and economic sustainability and suggests a strategy which leads to the involvement of community to promote the uptake of sustainability. In summary, this paper presents an example of an innovative approach to interior design practice, working towards the promotion of holistic sustainable practice.

*Keywords: Design sustainability, interior design, sustainable interiors, design process, product design.*

## 1 INTRODUCTION

Design professionals in the built environment have a significant responsibility for the delivery of sustainability and while much guidance and regulation is being introduced across Europe, and indeed the world, to encourage uptake, this is not the case for the field of Interior design and its professionals. This paper aims to explore the scope for implementation of sustainability principles in the field of interior design.

In order to achieve this it is first necessary to establish the meaning and scope of interior design, its professionals and sustainability within this context.

The profession of Interior Architecture is classified in the ISIC (International Standard Industrial Classification, rev.4, 2006, United Nations Statistical Commission) and NACE (Statistical classification of economic activities EC regulation 1893/2006) and reported in the European Charter of Interior Architecture Training[1] as follows: *‘This industry comprises establishments primarily engaged in planning, designing and administering projects in interior spaces to meet the physical and aesthetic needs of people using them, taking into consideration building codes, health and safety regulations, traffic patterns and floor planning mechanical and electrical needs, and interior fittings and furniture...’*

It can be said that interior design, however it is defined, is a creative practice that analyzes programmatic information, establishes a conceptual direction, refines the design direction, and produces graphic communication and construction documents to enable reality to be constructed.

In the United States "interior design" is also referred to as "interior architecture." However, practicing professionals cannot use the title of "Interior Architect" unless one complete the requirements for becoming a licensed architect. While in mainland Europe the term "Interior Architecture" is generally used. In many European countries the use of the title "Interior Architect" is likewise legally regulated (ASID), [2]. In Greece and more specifically in Cyprus, there is no legal regulation about the profession of Interior Design or Interior Architecture and indeed the term Interior Design is broadly known and used parallel to the term Decoration (Diacosmisi).

## 1.1 Interior Design Professionals.

The International Federation of Interior architecture/design (IFI) states that the professional interior architect/interior designer is a person qualified by education, experience and recognized skills, who:

- *“identifies, researches and creatively solves problems pertaining to the function and quality of the interior environment*
- *performs services relative to interior spaces including programming, design analysis, space planning, aesthetics and inspection of work on site, using specialized knowledge of interior construction, building systems and components, building regulations, equipment, materials and furnishings*
- *prepares drawings and documents relative to the design of interior space, in order to enhance the quality of life and protect the health, safety and welfare of the public.”* [3]

Furthermore, the British Interior Design Association (BIDA) defines interior designers as *“persons qualified by training and experience to plan the design and execution of interior projects and their furnishings, and to organize the various arts and crafts essential to their completion”* [4]. A designer is one who utilizes pertinent research and creatively solves problems pertaining to the function and quality of the interior environment. The interior designer provides a full consultancy service which includes: programming; design analysis; space planning; guidance on aesthetics; monitoring work on site; applying specialized knowledge of interior construction, building systems and components, building regulations, equipment, materials and furnishings as well as the most widely acknowledged preparation of drawings and documents relative to the design of interior space.

Further to this Amland (BEDA) writes that *“Design as we know it – a synthesis of skills known from crafts, architecture and engineering –has slowly adapted its own professional identity throughout the last half of the twentieth century. Today design is inextricably linked to the way in which society, culture and the environment interact. The environmental, social and moral responsibilities of designers are determining factors in our common exertion to foster a sustainable and harmonious society.”* [5]

## 1.2 What is sustainable design?

Simply, Sustainable design: ‘involves using design methods, products and processes that minimize the ecological impact of design and construction upon the earth and all species....’ (Pollack S. and Pillote L.2006) [6]

Additionally, we can say that sustainable design goes beyond being merely efficient, good-looking, on time and on budget. It is a design that reflects concern for the achievement of principles and that considers consequences for people and the environment. Environmentally responsible professionals concern themselves with a repeated search for methods to reduce the impacts of their design on global systems. Further, as Pullen writes [7], a sustainable home provides accommodation and facilities for present and future generations in a way that has the lowest possible impact on the ecology and on natural resources. This must be seen to apply to all stages of the building process: build, operation and finally its eventual demolition and/ or reuse.

Furthermore Stegall [8] states that the designers role, *“in developing a sustainable society is not simply to create ‘sustainable products’ but rather to envision products, processes, and services that encourage widespread sustainable behavior.”*

### 1.2.1 International Federation of Interior Architects and Designers’ Position on Sustainable Design.

The International Federation of Interior Architects and Designers (IFI) places an emphasis on the role of significant driving forces behind the green movement. namely, new national laws that have been formulated since the Rio Summit; laws formulated with the following aims: to protect health and environment; to protect nature and the cultural environment; to secure good economic use of land and water and; efficient use of resources; support recycling and reuse of materials.

Based on the above rationale, the IFI suggests specific environmental ambitions for interior designers, namely to: avoid materials hazardous to health or the environment. Significantly the IFI makes clear that these impacts may be at the manufacture, use and disposal phases and that they should all be considered relevant by their members. Simple advice provided by the IFI goes on to suggest that designer should aim to: use natural materials; avoid plastic or other non-renewable products; use sustainable materials and finally to consider the maintenance implications of their design solutions [9].

### ***1.2.2 American Society of Interior Designers Position on Sustainable Design***

Further to the aims of the IFI, the American Society of Interior Designers (ASID) believes that interior designers should endeavour to, whenever feasible, practice sustainable design. Interior designers should meet present-day needs without compromising the ability to meet the needs of future generations. In their “Position on Sustainable Design” [10], the ASID recognizes that sustainability should be an essential part of the interior designer’s professional responsibilities. ASID acknowledges that sustainable interior design embraces:

1. Integrated building design by collaborative multi-disciplinary teams;
2. Indoor environments that support occupant well-being and productivity;
3. Resource and energy efficiency;
4. Social equity at local and global levels;
5. Protection of the natural environment;
6. Positive economic impact of optimized operational and maintenance practices, and life-cycle cost assessments
7. Advocacy for safe products and services: Interior designers should advocate to their clients and employers the development of buildings, spaces and products that are environmentally benign, produced in a socially just manner and safer for all living things.
8. Protection of the biosphere: Interior designers should eliminate the use of any product or process that is known to pollute air, water or earth;
9. Sustainable use of natural resources: Interior designers should make use of renewable natural resources, including the protection of vegetation, wildlife habitats, open spaces and wilderness;
10. Waste reduction: Interior designers should minimize waste through the reduction, reuse or recycling of products and encourage the development and use of reclaimed, salvaged and recycled products;
11. Wise use of energy: Interior designers should reduce energy use, adopt energy conserving strategies and choose renewable energy sources;
12. Reduction of risk: Interior designers should eliminate the environmental risk to the health of the end users of their designs.

Furthermore, BEDA member Ezio Manzini asserts that: “*Environmental and social sustainability needs a discontinuity: from a society where a usual healthy condition was one of increase in production and material utilization, we must move to a society which is able of developing by reducing them, while improving the quality of the overall environment.*” It may be difficult to predict how this may come about, however, it is certain that a discontinuity will take place and that we must participate in a long period of transition. In this extensive process of change, design may be considered to have an important role, enabling the facilitating of forms of systemic innovation on an everyday level. [11]

## **2. PROFESSIONAL ENGAGEMENT WITH THE ENVIRONMENT**

In every project, interior designers make many decisions that impact on the environment either positively or negatively. However, the most important are related and may be summarized as: tropical deforestation; waste; resource consumption; climate change; as well as water shortages and pollution. An analysis of each of these issues in turn, can enable a more full comprehension of the designers’ potential to promote sustainability in their work. The following analysis draws upon MacKenzie’s sustainable approach to interior design decision [12].

### **2.1 Tropical deforestation**

The increasing claims made by Europe, North America and Japan for tropical hard woods is substantially being met by forestry applications which are not sustainable and while many companies suggest that they re-plant and cut down only a small amount of trees, the mass of felled timber from virgin rainforests results in the loss of habitat and biodiversity. The resulting endangering and potential loss of species reflects the impact of this unsustainable practice. Tropical hard woods tend to be associated with high value end-uses, such as furniture and long-lasting boards for exterior protection of buildings. A great deal of lumber, however, is used for chipboard, plywood and window frames. In these and other applications, we are using hard woods where other woods or different material altogether would be appropriate [12]. Further the destruction of forests influences water

distribution; air quality, soil productivity, and the functioning of the whole ecosystem in the region [12].

To address this problem, the simple design decision is not to indicate any tropical woods unless it can be proven that they are produced in a sustainable way. Timber merchants should be able to provide this information, and, at present, all trustworthy traders should be capable of advising and supplying effective alternatives for traditional tropical hard woods.

## **2.2 Waste**

The most efficient way in which to address the problem of waste disposal is to generate less waste. This is an area where designers can play a very important role, and where good design can truly make a difference. For example, when choosing material and in particular, when launching new material, designers should take into consideration the likely impact of that material on its eventual disposal [12]. Also as Pilatowicz [13] writes '*Building practices are costly and wasteful.*' More than 10% of landfill waste comes from the construction industry. Therefore designers can play a significant role by minimizing the effect that the interior space will eventually have on landfills. Examples of strategies to achieve this include design for reuse, design for deconstruction and the use of recycled or reclaimed materials.

## **2.3 Resource Consumption**

Resource consumption is a further, related sector in which designers can play a role, as Pullen [7] writes, 50 % of material resources taken from nature are for buildings. Shaping the fashion towards minimalism is one approach to material preservation, while another may be the design of multi-purpose furniture and appliances. Moreover, such machines, manufactured with an eye toward conserving energy could be recommended [12]. Anderson [14] writes that well-organized and fair use of resources is a fundamental social state.

## **2.4 Climate Change**

In order for designers to play a role in mitigating climate change they must ensure that their impact on greenhouse gas emissions are reduced. This can be achieved in several different ways: through the reduction of embodied energy of materials; through energy efficient design; through the selection of low energy appliances and equipment; and finally through the consideration of energy sources, namely the use of renewable or low carbon energy. Designers' actions may therefore include: the selection of materials which have been produced efficiently, thereby reducing the embodied energy. For example, packaging manufacturers are now providing details of the energy costs of different materials; by selection of insulation materials to preserve energy; through the use of passive design techniques to ensure that the built environment benefits from the available solar and wind energies and finally through the integration of active systems such as solar thermal and photovoltaic panels. It is clear that prospects exist for scientists and designers to develop products and buildings powered by alternative sources of energy, but energy efficiency is perhaps a more primary ambition for design. This is clearly related to energy in use, although the quantity of energy used to produce materials, their embodied energy, is also significant. For example, recycling of 1kg of aluminium saves up to 6kg of bauxite, 4kg of chemical products and 14 kWh of electricity [15].

## **2.6 Water**

In relation to water, designers have a significant role in both the reduction of usage as well as protection from pollutants. Indeed access to clean drinking water is likely to become as important, in some regions, as energy efficiency. Designers should therefore specify and design household appliances and behaviours that reduce water usage, including creative devices for collecting and using rain water. In relation to pollution, designers must limit their direct impact on water pollution, but equally significant is the specification of materials that do not cause pollution during their extraction, manufacture and disposal. As a minimum requirement, providers should be able to demonstrate that manufacture does not breach local environmental legislation. [12]

### 3. EXAMPLES FROM LITERATURE

Throughout the world, designers and architects have become committed to the concept of environmental or green design, either for their clients or for themselves. Older housing stock, industrialized and other commercial spaces are being restored, updated and renewed as contemporary abodes.

#### 3.1 Alvar Alto

The first example refers to an exhibition of furniture and glass works by Alvar Aalto was programmed by the Museum of Modern Art in New York in 1986 by Shigeru Ban Architects [16]. Although the intention was to design an exhibition space, which would reflect an Aalto interior, budgetary limitations prevented the extensive use of wood in the same style as the Finnish master. A particular concern was that the building materials were destined to be dismantled and disposed of after the exhibition. In order to avoid this expense and perceived inevitability of waste, recycled paper tubing was adopted as an alternative material and was used to create ceiling panels, partitions and display stands. These material explorations in this exhibit design might be considered to mark the beginning of 'paper architecture'. In the case of this exhibition, a clear link can be made to the sustainable ambitions of interior design identified within this paper, namely, waste reduction, resource and energy efficiency. In addition the design solution resulted in a positive economic impact of optimized operational and maintenance practices.

#### 3.2 Peter Zumthor

As a second example, the Swiss pavilion at Expo 2000 shows what designers can do in order to allow materials to be used again and again having in mind de-construction. As Brooker and Stone write : *'The designer has a responsibility to consider not just the expected life of a particular building or project, but also the future life or use of the materials embedded within that project.'* [17]. This example is a clear connect of design issues with waste reduction and the way that both IFI and ICED are suggesting designers to use resources. This solution clearly provides economic sustainable solution while again following the concept of reuse and resource efficiency.

#### 3.3 Henner Kuckuck

Henner Kuckuck's designs employ unexpected materials that are adapted to the environment. They include aluminum and recycled plastics, and the Formica Corporation has supported Kuckuck's explorations into the use of recycled materials as well. In his designs he also takes into consideration the issues of weight, storage and transport. Many of his pieces are fabricated to: be as light as possible; reduce the amount of materials consumed; allow for shipping at the lowest rate possible; and finally to collapse in order to store easily. [18]

Kuckuck describes sustainable concerns thus: *"Protection of the Biosphere: we should eliminate the use of any product or process that is known to pollute air, water or earth and Sustainable Use of Natural Resources: we should make use of renewable natural resources, including the protection of vegetation, wildlife habitants, open spaces and wilderness"*. [18]

#### 3.4 Ada Tolla

Lot/EK (Ada Tolla, Architect with Guiseppe Lignano) pieces are meant to be multifunctional, a trend they perceived as key for the 21<sup>st</sup> century. Their philosophy is underpinned by this statement: *"If you live in the countryside, nature provides you with trees. The city produces waste so we use that for our designs"* [19]. Lot/EK's renovation of the kitchen in Alessandra Aleci's brownstone in Manhattan's Chelsea district is representative of environmental recycling in its most literal sense. Innovative elements were made from wooden police barricades, metal signs, food crates and other typically urban matter. Further they have recently designed a library in Guadalajara made entirely of refurbished airplane fuselages [19]. This example illustrates literally, the potential for direct reuse, rather than more energy intensive recycling of airplane parts, for which previously no function could be conceived of. In this way waste is minimized through the reduction, reuse or recycling of products and encourage the development and use of use of reclaimed, salvaged and recycled products.

Fortunately, there are numerous emerging examples in this manner, and so we can begin to consider that not only design professionals, but then public and clients too are beginning to become sensitive to

their environmental impact and will therefore start to be more energetic in a joint ambition to ‘green’ their own built environment.

#### 4. A NEW DESIGN SOLUTION

With the presentation of this emerging design work, this paper aims to illustrate the development of an innovative way of design thinking that applies evolving sustainability principles directly into the interior space. The intention of this work is to relocate all the qualities of the sustainable design process within the interior space. As Stuart Walker posits, “*Design is purposeful and does have utilitarian intent. It is driven by social and/or economic motivators, and products are designed to be purposeful.*” He goes on to say, “*Design can be regarded as an activity which, potentially, bridges the different sides of our nature and becomes a holistic endeavor that looks towards our inner self.*” [20] Therefore objects and spaces that have been designed from recycled materials gathered from the community and processed in small workshops employing local workers represent an enhanced and holistic embodiment of sustainability.

##### 4.1 Work Process for paper blocks

A rational course of action for an urban designer is the utilizing of the waste provided by the city. An easily applicable pattern would be asking people in a local neighborhood to collect their newspapers and magazines, rather than disposing of them in their rubbish. (See figure 1)



Figure 1: Waste paper



Figure 2: Paper mass

The specific idea, illustrated here, uses recycled paper blocks, a raw “waste” material not currently recycled centrally in the author’s neighborhood. An informal recycling system was already in place, where the author gathered the paper refuse of near neighbors and transported them collectively to a paper recycling facility near to their place of work. This community based project highlighted that people were willing to recycle and, in fact, wanted to become more involved in this process, despite a lack of support from the central state. The concept of this waste as a material emerged, following research into sustainability in the context of interior design and as such the initial action was to explore creation of a series of paper blocks. They were magnificent, warm to see and to touch, with a neutral colour overall, but some vivid areas of white paper, together with splashes of colour from the pages of magazines, also evident (See figure 2). Feedback from those involved was very positive as the concept eliminated both products and processes known to pollute air, water or earth. In addition participants identified potential benefits of the process in terms of social equity at local and global levels as well as the inherent protection of the biosphere as a result of recycling of materials.

Following the development of the process, a simple design for an interior object was developed, a three-piece, easily-assembled coffee table that could also be used as a small stool in a living area. The design intention of this was to encourage and promote the accessibility, uptake and use of reclaimed, salvaged and recycled products. The design appeared on paper as some cubical pieces which are able to play together by changing positions. Apart from the combinations illustrated, their scale and thickness was explored in order for the object to be more flexible. (See figure 3). The final design has dimensions of L: 90cm×h: 35cm×w: 45cm.

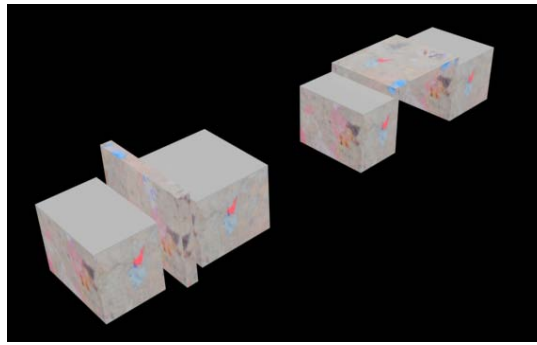


Figure 3: Paper blocks

This concept provides the potential for a series of modular paper blocks that can be combined together, as is required, in order to create different interior pieces. While the initial realization of this idea resulted in a small coffee table, these pieces can be extended from this small scale piece through to a polymorphous rectilinear partition wall.

A further aspect of the design emerged through collaboration with a graphic designer, where the opportunity for the surfaces of the table could emerge as a clear surface with informational text. Here greater emphasis to the style and content of the text itself was given. Thus, in the emerging design two glass surfaces bearing printed information provide the surface of the table. An extended accompaniment to the original project goal, then, is the attempt to “recycle” the information content of the wasted paper. In this way the information becomes one with the 3-dimensional object, which can also be used as a forum to inform the user about environmental and other relevant issues. (See figure 4).

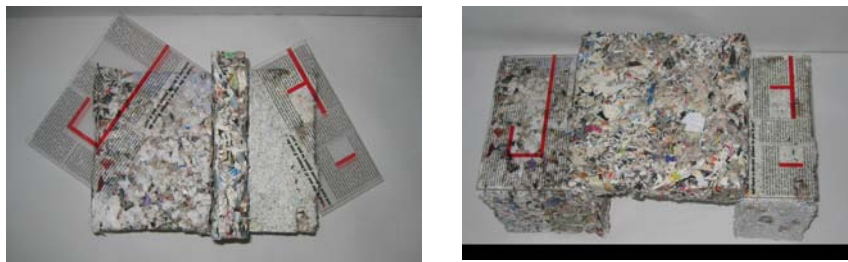


Figure 4: End product views

The role of the community in the delivery of this design can be widened from the initial paper collection, described here to involvement in the making process. For example, while the cast for the production of different sizes of paper mass blocks should be produced in a skilled carpenter’s workshop, it is suggested that this should be selected as a craftsperson willing to cooperate in creating the final product. Unskilled workers, such as unemployed members of the community, can then be involved in the construction process. The whole design and making process is both creative and has the potential to increase the community’s awareness about environmental issues.

## 5. CONCLUSIONS

The intention of the designer of the created piece of work is to transfer all the qualities of the selected design process within the interior space. Also this concept additionally provides a place of involvement for the wider community throughout its realization. Wahl and Baxter write: “*Since sustainability requires widespread participation, communities everywhere need to begin to shape local, regional and global visions of sustainability, and to offer strategies to engage humanity collectively in cooperative processes that will turn visions (designs) into reality.*” [21]

The benefits associated with this potential shift from the conventional design process to one that embraces community engagement in many aspects, it may be possible to impart new values to interior spaces through our designs. Designers offer to community, and the community asks for more sustainable design solutions. As a result, of this cooperation designs will carry essential, and more

lasting, values. First value the use of a making process which is not harmful to the environment; second, community involvement; and finally consumers that will be exposed to the displayed text. The object has the potential to transfer its environmental and sustainable values at different levels. Generally creates an interdependent relationship between the professionals and the community that is suggested here and should be tested and promoted further.

This is in agreement with Manzini [11] who writes that: “*Design by its very nature, is an activity that bridges the gap between the socio-cultural and the techno-economical dimensions of the production and consumption systems.*”

## REFERENCES

- [1] European Charter of Interior Architecture Training 2007, European Council of Interior Architects,p.5,2007
- [2] American Society of Interior Designers (ASID), <http://www.asid.org/asidfordesigners.htm>
- [3] International Federation of Interior Architecture/Design (IFI),[http://www.ifiworld.org/intex.html#Definition\\_of\\_an\\_IA/D](http://www.ifiworld.org/intex.html#Definition_of_an_IA/D)
- [4] The British Interior Design Association (BIDA), [http://www.bitad.org/join\\_designer.htm](http://www.bitad.org/join_designer.htm).
- [5] Amland S., Design Responsibilities, (section B), *Design Ethics and Philosophy*, Stuart Macdonald, Barcelona, pp22-24,2004
- [6] Pollack S.J. and Pillote L., Preliminary Teaching Manual for Sustainable Design Education,Interior Designers Educators Council, 2006,
- [7] Pullen, T. Simply Sustainable Homes. Ovolo Publishing, Cambridgeshire, UK, 2008
- [8] Stegall, N. Designing for Sustainability: A Philosophy for Ecologically Intentional Design. *Design Issues*, 22 (2), pp.56-63, 2006,
- [9] International Federation of Interior Architects and Designers, [www.ifi.org](http://www.ifi.org)
- [10] American Society of Interior Designers, [www.asid.org](http://www.asid.org)
- [11] Manzini. E. Design Responsibilities, (section B), Design as a tool for environmental and social sustainability, Stuart Macdonald, Barcelona, pp 24-26,2004.
- [12] McKenzie, D. Green Design: Design for the Environment. Laurence King, Ltd, London, Great Britain, 1991.
- [13] Pilatowicz, C. Eco-interior: guide to environmental conscious interior design. John Wiley and Sons, Inc: New York, USA, 1995.
- [14] Anderson O. Ecology. IFI green matters, International Federation of Interior Architects and Designers, pp.7-8, 2003.
- [15] Waste Watch: [http://www.wasteonline.org.uk/resources/Information\\_Sheets/metals.htm](http://www.wasteonline.org.uk/resources/Information_Sheets/metals.htm)
- [16] Shigerou Ban Architects, <http://www.shigeroubanarchitects.com>
- [17] Brooker G. and Stone S.Basics Interior Architecture-Context and Environment. Ava Publishing SA,2008.
- [18] Henner Kukuck, <http://hennerkuckuck.tripot.com?id4.html>
- [19] Inhabitat by J.Fehrenbacher:<http://www.inhabitat.com/2006/04/19/lo-teks-recycled-airplane-library/>
- [20] Walker, S. How the Other Half Lives: Product Design, Sustainability, and the Human Spirit. *Design Issues* ,16(1), pp.52-58, 2000.
- [21] Wahl. D & Baxter, S. The Designer’s Role in Facilitating Sustainable Solutions. *Design Issues*, 24(2), pp. 72-83, 2008.

Contact:Ioannou Kazamia K.  
University of Nicosia  
Department of Architecture  
Makedonitissas Ave.  
P.O.Box 24005,1700,Nicosia  
Cyprus  
00357 22841500  
0035722357481  
[ioannou.k@unic.ac.cy](mailto:ioannou.k@unic.ac.cy)



Kika Ioannou Kazamia is an assistant professor in the Interior Design Program of the Architecture Department at the University of Nicosia. Her area of concentration and research interests as interior designer and educator is the implementation of environmental and sustainability issues in interior design and the importance of environmental education.

Julie Gwilliam is a lecturer at the Architecture School of Cardiff University. Her main research interests lie in the exploration of the potential impacts of global climate change on the build environment, specifically in the areas of occupant health and comfort and building integrity. She also interested in the study of environmental design and sustainability as applied to the build environment.