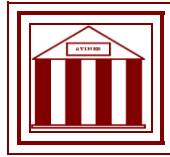


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ENV2014-1336

**Environmental Aspects in Designing
Spaces and Furniture for Children**

**Pavlina Vodenova
Assistant Professor
University of Forestry
Bulgaria**

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This paper should be cited as follows:

Vodenova, P., (2015) "Environmental Aspects in Designing Spaces and Furniture for Children", Athens: ATINER'S Conference Paper Series, No: ENV2014-1336.

Athens Institute for Education and Research
8 Valaoritou Street, Kolonaki, 10671 Athens, Greece
Tel: + 30 210 3634210 Fax: + 30 210 3634209 Email: info@atiner.gr
URL: www.atiner.gr

URL Conference Papers Series: www.atiner.gr/papers.htm

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ISSN: **2241-2891**

23/01/2015

Environmental Aspects in Designing Spaces and Furniture for Children

Pavlina Vodenova
Assistant professor
University of Forestry
Bulgaria

Abstract

The conception of ecology, the use of ecological materials for an eco home and smart designing of less harmful products which sustain high quality of living have recently become an essential part of the children's interior spaces. The main goal is to minimise the harmful effect over the environment and to improve the relationship between man and nature.

The development of our consumer society has led to the arising of many questions concerning the ecology of the materials, their impact over the environment and their recycling possibilities. The last are crucial for the progress of our world and they can no longer be neglected. What is more, the ecological requirements in the industry have become as important as the ones concerning the quality, the functionality, the ergonomics, the aesthetics, the safety of the product etc. The European Union's requirements and directives give shape to the ecological aspect of the industrial production as one of the main factors professionals should consider.

All of the above contributes to environmental furniture and products to become extremely fashionable in the new millennium, and gives rise to a separate branch of design called ecodesign. Ecodesign, also known as "green design", "sustainable design", "design for environment" in its nature is the design of products and services that comply with the principles of sustainable development - achieving a balance between economic and social goals and environment.

Keywords: Ecology, children, design

Acknowledgments: This document was supported by the grant No BG051PO001-3.3.06-0056, financed by the Human Resources Development Operational Programme (2007 – 2013) and co-financed jointly by the European Social Fund of the European Union and the Bulgarian Ministry of Education and Science.

Introduction

The conception of ecology, the use of ecological materials for an eco home and smart designing of less harmful products which sustain high quality of living have recently become an essential part of the children's interior spaces. The main goal is to minimise the harmful effect over the environment and to improve the relationship between man and nature.

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All of the above contributes to environmental furniture and products to become extremely fashionable in the new millennium, and gives rise to a separate branch of design called ecodesign. Ecodesign, also known as "green design", "sustainable design", "design for environment" in its nature is the design of products and services that comply with the principles of sustainable development - achieving a balance between economic and social goals and environment. Its major priority is to minimise the use of non-renewable resources and the harmful impact on the environment as well as stimulating the relationship between man and nature.

Why Ecodesign?

Ecodesign could also be the answer of the global economic crisis. Regarding the fact that the economy is developing at astonishing rates, while taking up most of the natural resources, harming the balance of the ecosystems and decreasing the biodiversity, we are facing a challenge to find a solution for these negative aspects of the mass production of goods and services. Green design is considered to be one of the most effective approaches in this delicate situation, mainly because it preserves the quality of life while using smart designing of less harmful products and processes, which could easily replace the conventional methods which are currently in use.

Over the last couple of years many researches and projects have started, which prove the necessity of implementing the ecodesign principles in the furniture industry. Furniture Industry Research Association (FIRA) working together with leading professionals from the field as well as trade associations had a proving statement in its report for the industry development for 2020. FIRA considers the energy savings, the effective use of materials and the recycling processes to be among the most important causes for the business in the near future. What is more, the expenses of furniture and wood waste

disposal have raised substantially and have reached 3.6% of the working capital of the furniture industry in Great Britain, which equals 250 000 000 GBP annually. FIRA is positive that around a half of these expenses could be spared if innovative design solutions are applied.

A good example could be the elite Spanish manufacturer Ofita which has partnered with the IHOBE, the Basque Environmental management for an ecological design project. Applying the principles of sustainability Ofita reinvents one of its products- an office desk. As a result the product receives better aesthetic and functional properties, while the company saves 52% of the materials used in the process, develops its product and corporate image and increases its international market share.

In designing children's furniture and interior spaces, our main priority which must not be disregarded, has to achieve maximum safety of the environment both ecologically and functionally.

According to the researchers in the field, a child develops stronger immune system when he lives in a healthy, ecological and aesthetic environment. Another important aspect of children's environments is the selection of colours, design and shapes of the furniture, which not only affect children's health and growth physically but also encourage their behaviour, stimulate their moods and thinking manners, educate their proper selective ability etc.

Keeping all of this information in mind we are naturally bringing up the question - What makes specific interior or a specific piece of furniture ecological?

At first we have to take into account the use of all the materials and the energy over the entire life of the product - from the cradle to the grave. Most of the products of our mass production system follow the same conventional life cycle- materials are put into production, products are transported and sold, products are serving their purpose and at the end, they're being thrown away. The truth is that in our daily routine we use and get benefits from only 10-20% of the goods that we own.

The cycle "Cradle to the grave" should be substituted by "Cradle to cradle" [1] - the product should be designed to live a new life after its first one and continue doing it afterwards. This is why it is important for designers to come up with ideas and products which have been carefully premeditated. However, we also need to answer the most important question- are these products and services truly necessary? Do we really need them? [2]

The materials used in the manufacturing processes are the main factor that determines the industry's influence over the environment. The raw materials we need for production should be limited to the highest extend while also preserving the properties of the products at the end of the line. The less materials we use, the less we will extract, process, transport and then leave in the junkyard. Moreover, it is also an ecological solution to minimise the variety of materials used in a single product thus keeping it simple and easier to recycle.

The choice of less harmful materials for the environment is also of great significance. The selection process should be supported by some simple rules such as the following:

- The materials should be derived from renewable resources;
- They should be recycled easily and effectively;
- They should not contain harmful compounds or other ingredients;
- They should be produced with the least possible harmful methods for the environment;

The right selection of the materials for the production processes of the variety of products we need should be based on both the ecological aspect of preserving the environment and the humanitarian aspect of preserving our health. The materials must not be dangerous for our health, but also their use should be justified- we should not use ecological materials just because we want the products to be labeled as “eco” without no other purpose or meaning.

One of the most important factors in the design process of children’s rooms is achieving the maximum safety of space and equipment.

This can be achieved by the optimal selection of the flooring and the wall covering materials, as well as the materials for the furniture. Setting up the interior of the residential and public buildings we use a variety of materials but the essential part is given to wood and the wood-based materials- wood boards, plywood, particle and fibreboards etc. A lot of different binding substances are used in the production processes of these wood materials with constructional purpose but the most common are phenol-formaldehyde, resorcinol formaldehyde, melamine formaldehyde and urea (carbamide) formaldehyde. In the construction process of the furniture for the children’s interior spaces we need to follow some specific directives and must only use materials with low emission range (labeled E1) which means that the quantity of the formaldehyde released in the atmosphere should be less than 10mg for 100g material mass. It is also good to consider that the materials used should have natural origin, feel warm when touching, stay smooth after processing and form rounded edges and shapes as a final furniture piece. The decorative coatings used in the production should not contain any heavy metals and should not emit any volatile harmful compounds. As a positive response to this directive we can choose the use of water-dispersible varnishes as well as the natural oils and waxes.

Concerning the flooring in the children’s rooms it is good to avoid the use of carpets because of their unpleasing property to collect dust which is a good precondition for developing allergies or even asthma in the future. A positive choice would be the hardwood flooring (parquet, cork floorings, linoleum) which is very easy to clean, hard to dirty and scratch and warm when touched.

Over the last decade we have witnessed the rapid growth of technologies in the field of wood processing industry including the production of wood-based materials. The products of the thermoplastic processing methods of wood, specifically, are said to become more and more popular in all market

areas. The new extrusion technology for thermostatic fibrous materials combines the positive properties of wood together with the multiple possibilities of processing the synthetic materials. An indisputable priority of these types of materials is the possibility to mould three-dimensional objects and complex geometrical shapes and also achieving high mechanical properties, 100% recycling properties, high production rates, complete restoration of the initiate resource etc. These materials are successfully implemented in furniture systems, toys, as well as many other production fields such as electronics, automotive industry etc. Their composition of maximum 95% natural components and organic carbon compounds provide a better ecological assessment compared to other popular products.

When designing for mass production, it is important to consider that the longer the life of the product, the less is the need to replace this product with a new one thus minimising the harmful effect of the industry on the environment. Some of the actions needed to be taken into account are as it follows:

- It should be made possible and also stimulating to reuse products;
- The weak properties of products should be identified and thus eliminated;
- Adequate raw materials should be chosen, ones which are durable and resilient to the continuous application of the product;
- Designs should be based on module systems because they give the opportunity to change the product functionality according to the needs of the client;
- Fixing and maintaining the product in good conditions should be made easier;
- It should be easier to supply reserve parts for the product;
- Integrating more functions into a single product gives its multitasking character which minimises the need to own and use separate products.

This is one of the most important aspects when designing children's furniture. Due to the fact that children change very dynamically not only physiologically but also psychologically, some of the furniture become useless or useful only at a certain period of their growth. This is why it is good to design multipurpose furniture pieces that serve more than one purpose such as sleeping and storage, sleeping and individual work etc. This prevents the unnecessary clutter in the rooms while at the same time it makes it more convenient because less new objects are needed over time.

The life of a product can also be extended when promoting it to a larger audience. For instance it can be given for lending. In numerous European countries (Belgium, France, Great Britain etc.) there exist a popular practice of lending items in the so called "Children libraries". These are organisations, sometimes financed by the state and the county or an official part of parental cooperation practices, which are in charge of storing and lending the items for a minimal fee. These items could be furniture, toys or other products for

children which have specific character and thus, are usable only for a short period of time. In this way, every family could afford to use these items when they really need it and then easily get rid of it by giving it back when they no longer see the use of it. The unusable product doesn't go to the trash, but back into storage to wait for its next owner. This makes a product's life multiple times longer than usual while in the same time it meets the needs of not only one child, but many others. Unfortunately, these types of organisations are still not famous enough in Bulgaria. Here, this practice exists in a relatives' or friends' circle only without having any specific structure or rules. The existence of such lending service would have great positive effect and thanks to the technological advance and all the information around we can be sure that it will become a part of our everyday life soon.

Conclusions

Ecodesign is an approach, a thinking model, which should be integrated into the contemporary design methods and practices. It can be based on various innovative ideas where the mutual distinct concept is reduction of the harmful effects on the environment, the products and the services during their entire lifecycle. All of this can be achieved while using the following recommendations:

- First, it is necessary not to design specific products, but to design and rethink their whole lifecycle.
- The materials used for production have a great effect on its ecological assessment. It is important to make wise decisions to choose the right type of material, to use as less material as possible and to try to avoid combinations of this material with others for the production of a single product.
- The products need to be designed well in order to have a longer lifespan.
- Products need to be multifunctional.
- Products need to be shared with others.

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