Understanding the Significance of Nature as an Integral Part of Interior Design vis-a-vis Kindergarten Architecture

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ABSTRACT

Realization over the importance of nature opened the way to question different aspects of human life and it was found that people start to spend more and more time indoors due to several reasons like safety, job-related factors or personal factors. This increase in spending time indoor is equal to spending less time in contact with nature. Thus, people started to look for ways to integrate nature in all aspects of their lives as much as they can.

The significance of this research lies in the benefits of interaction with nature mainly for children who live in the apartments, without any contact or with too little contact with nature. Connection with nature will contribute for children's development physically, spiritually, socially. Therefore, more attempts should be create in order to bring nature into the indoor spaces.

The study aims to explore the significance of nature as a significant tool in interior spaces design, specifically in kindergartens. It first looks at the relationship of nature and interior architecture/ design. Then it evaluates many kindergarten cases from different countries. Finally from the same perspective a local case "Levent kindergarten" is examples and the case study analysis was conducted according to the criteria derived from the books, an interview conducted with the architect, and questionnaire with teachers might support to understand the integration of nature in kindergarten from their views and opinion.

Keywords: Interaction with nature, Interior design, Kindergarten Architecture, Levent Kindergarten.

ÖZ

Doğayı anaokulu iç mekanlarına entegre etme olgusunun hem insan psikolojisi hem de insan sağlığı üzerinde olumlu etkileri var. Buna göre iç bahçe, teras, eko-çatı gibi kavramlarla çocukların doğayla etkileşimi sağlanıyor. Buna ek olarak, düzlemler (dikey bahçe, yükseltilmiş bahçe, iç bahçe); yüzeyler (doku, materyal, renkler); nesneler (elementler, mobilylar); ve büyük pencelerden içeri çağırılan doğal ışık veya tepecamı gibi iç mimari faktörler de doğayla etkileşimi artırmak için kullanılabilir. Tüm bu özellikler iç mimari için bir kriter olarak düşünüldü ve bu kriter araştırma için dünyanın farklı yerlerinden anaokul örneklerini değerlendirmede kullanıldı. Bu araştırma, doğanın anaokul iç mimarisinde kullanılmasının olumlu etkileri ve doğanın insan hayatındaki önemi kanıtlamayı amaçlamaktadır.

Bu araştırmanın önemi apartmanlarda yaşadıkları için doğayla etkileşimi çok az yada hiç olmayan çocukların hayatında doğayla etkileşimin olumle etkilerinde yatmaktadır. Doğayla bağ kurmak, çocukların fiziksel, ruhsal ve sosyal gelişimlerine olumlu katkıda bulunur. Bu sebeple, doğayı binaların iç mimarilerine entegre etmek için daha fazla çaba sarfedilmelidir.

Bu çalışma, doğanın, iç mekan tasarımında özellikle anaokul tasarımında ne kadar önemli bir araç olduğunu keşfetmeyi amaçlamaktadır. İlk olarak doğa ile iç mimari ve iç tasarım arasındaki ilişkiye bakılmıştır. Daha sonra, farklı ülkelerden birçok anaokul örnekleri değerlendirilmiştir. Ve son olarak, aynı bakış açısından, Levent Anaokul'u geçrek yaşam örneği olarak seçilmiş ve kitaplardan yola çıkarak hazırlanan kriter

kullanılarak değerlendirilmiştir. Kritere ek olarak, mimarla karşılıklı görüşme gerçekleştirilmiş ve öğretmenlere anket dağıtılarak doğanın anaokul iç tasarıma entegre edilmesi hakkındaki görüş ve düşünceleri sorulmuştur.

Anahtar Kelimeler: Doğa, İç Mimari, Anaokul Mimarisi, Levent Kindergarten.

To all my family

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I would like to dedicate this study to the soul of my parents, and I would like to thank all my family members, my brothers, sisters, all my friends, for supporting and encouraging me to pursue this degree. Without their support, I would never be where I am today.

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INTRODUCTION

Even though it is difficult to study human mind and psychology, there have been several studies that tried to analyze human mind in order to find out about the relationship between nature and human. The trial studies came from different disciplines such as ecology, biology, environmental psychology and psychiatry. These studies have concluded that humans are dependent on nature for psychological, emotional and spiritual needs (Maller et al., 2009).

This realization over the importance of nature opened the way to question different aspects of human life and it was found that people start to spend more and more time indoors due to several reasons like safety, job-related factors or personal factors. This increase in spending time indoor is equal to spending less time in contact with nature. Thus, people started to look for ways to integrate nature in all aspects of their lives as much as they can.

In the past decades, the benefits of connecting to nature have been well documented in numerous scientific research studies and publications. Collectively, this body of research shows that children's social, psychological, academic and physical health is positively impacted when they have daily contact with nature. Positive impacts include the following:

- ✓ Supports creativity and problem solving
- ✓ Enhances cognitive abilities
- ✓ Improves academic performance
- ✓ Reduces Attention Deficit Disorder (ADD) symptoms
- ✓ Increases physical activity
- ✓ Improves nutrition
- ✓ Improves eyesight
- ✓ Improves social relations
- ✓ Improves self-discipline
- ✓ Reduces stress, (Natural Learning Initiative, 2012).

1.1Problem Statement

We are living in an era that the urbanization, increased rate of technology and societal development has caused changes in the lifestyle. Lifestyle in this context is used as an umbrella term to cover all aspects of daily life. These aspects include eating, clothing style, living conditions, cars, parenting, etc. People are thinking what is best for our planet in all aspects of their lives. Organic food, organic fabrics, recycling, smart cars, using solar systems for heating at houses are only some of the precautions people are taking to save the planet. The changes have also made the world a more dangerous place to live. Increased crime rates, technology becoming a part of our daily lives are also forcing people to be more aware of the world problems as parents.

Due to such changes, people demand to feel secure; especially parents try to prevent their children from any type of danger. Working parents have an additional worry on

what will happen to their children. Due to safety reasons, children are forced to stay indoors almost without any contact with nature which is proved to be a vital element in children's development. Despite the fact that world has become a more dangerous place to live, parents still feel the responsibility of saving our planet for their children. Parents also want their children grow as environmental friendly and feel responsible for the world. The best way to do this is to integrate nature into children's lives. When nature is a part of children's daily lives, it is easier to make them more aware of the importance of nature in the world. These conditions have led to the starting point of this study: the idea to invite nature to change the atmosphere of a closed space. However, the options for using and adding nature into interior architecture are very limited and there are not many studies carried out towards that. To put it simply, the problem statement for the basis of this research is the lack of nature in school structures and interior space design.

According to Dudek (1979, p.6), a famous designer who specializes in designing for educational purposes, with the rapid development of society and urbanization, industrialization, the children became surrounded with more constraint, those who are living in apartment, any house without touching to the nature, and the urgent need to create the suitable interior environment to make them more creative. It's clear that study after study reinforces the principle that nature enhances children psychology. Dudek also adds, "technology has changed the world. I believe it will continue to do so at an ever-increasing rate." (1979, p.22).

Maller et al. (2009) states that isolation from the natural world may be harmful to health is not limited to scientists and researchers but is also seen in the choices of everyday people.

1.1.1 Research Questions

So, the research question for this study is formulated as: How can interior designers and architects integrate nature to interior architecture of the kindergarten? In addition to this main question, some sub-questions have also been formulated such as: How can children interact with nature while they are indoors? What is the interior space needs in terms of nature that enables interior designers to bring in nature day-units? What are the characteristics of kindergarten interiors that are successfully in dialogue with nature? There is a main question that we should bear in mind: Caring for nature, and trying to integrate our lives and spaces with nature – is it a matter of possibility or necessity? Even though, we are not at a point to give a precise answer to this question; it is obvious to many designers that integration of nature to our daily activities and spaces have is more than just a "decorative" one purpose.

1.2Aim of Research

This study aims to explore the role of nature as a significant tool in interior spaces, specifically in kindergartens. It assumes that user interaction with nature has positive effects and that enabling strong connection of interior space with nature, usage of natural materials, incorporating color schemes which are in harmony with nature helps to create comfortable and psychologically nurturing environments. Within this context, this study aims to evaluate many kindergarten cases from different countries and carry out a case

study at Levent kindergarten as a real-life example. By doing so, this study hopes to form the basis of an up-to-date vocabulary towards the creation of a modest theoretical approach to kindergarten interiorscape design.

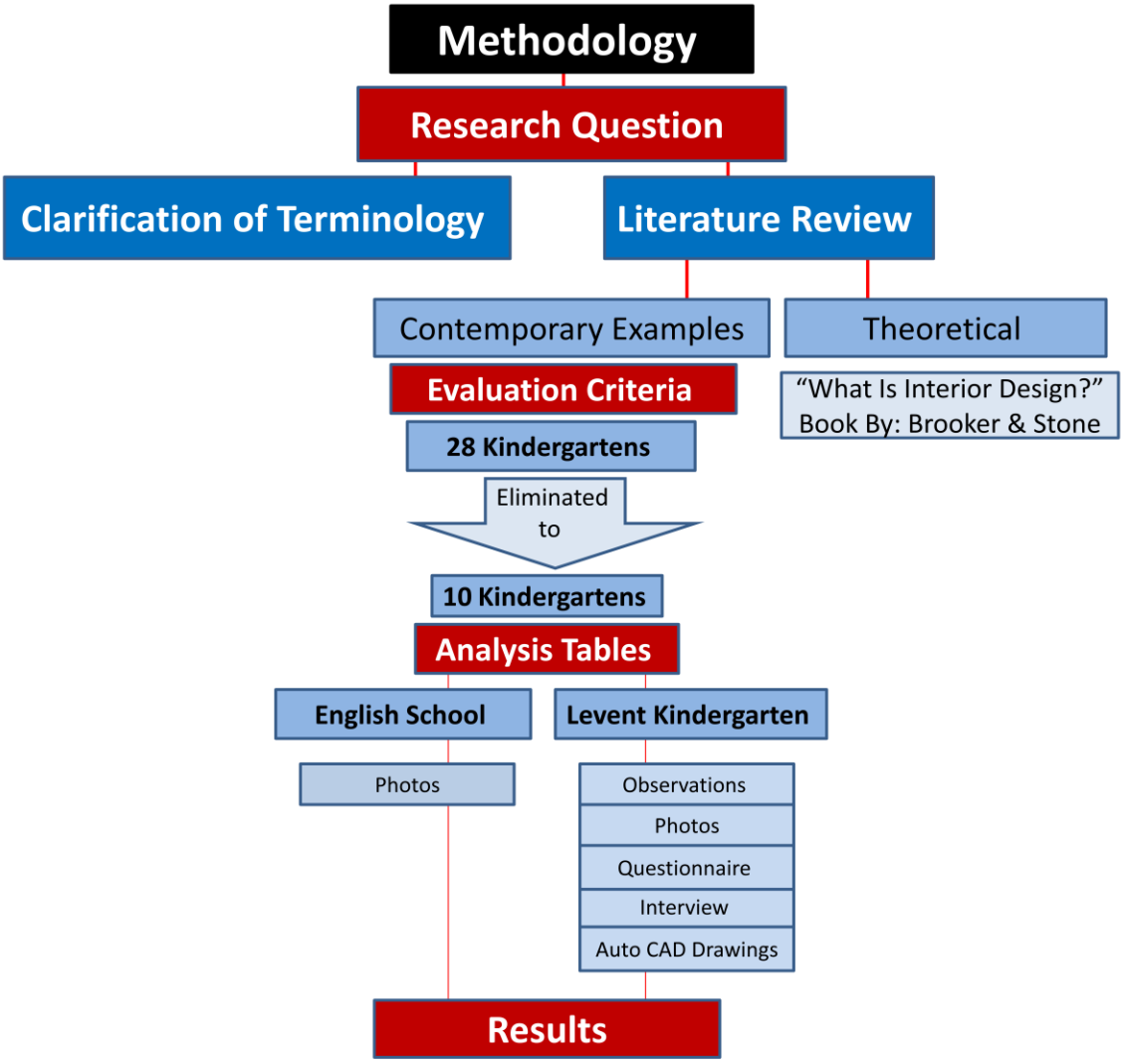
1.3 Limitations

There are several limitations to this study as well. The biggest limitation and challenge was that this specific topic does not belong to a single concept. In other word this subject is not ecological, green architecture, environmental nor it is not about re-cycling. Despite the fact that all of these fields are inter-related, the topic of this research belongs to all at the same time, yet without focusing on a single one of these inter-related topics. Thus the study can be seen as a pioneering research in future due to the multi-disciplinary nature of the topic. Another limitation is that the study is only specified to kindergartens and tries to look at 'how nature can be brought in when children cannot go out'. Thus, it does not focus on different types of plants, agricultural elements like horticulture, nor does it go into a detailed technological terminology of interior landscaping. Clarification of terminology was one of the biggest limitations of this study. Clarifying the terminology for the evaluation of the real-life examples was compulsory and inevitable during the research process. However, specifying this terminology became a limitation when it had to be done through discourse analysis. Analyzing media, successful examples, products, architects were all part of discourse analysis. Thus, separating discourse analysis from literature review and clarifying the terminology based on that analysis were the two most important limitations of the study.

1.4 Methodology

The methodology of the study has four main stages. The first stage was reviewing literature in order to find out how nature have been integrated into the interior spaces of different buildings like schools, houses, shops, offices, etc. The second stage aimed to focus on defining the terms on the basis of the reviewed literature and the successful examples. The third stage included evaluating ten kindergarten examples on paper. It was checked to see which elements and terminology were found in the ten examples during the evaluation process. And the last stage is to look at a real-life example of a kindergarten that integrates nature indoors, Levent Kindergarten in Nicosia, see all these steps please refer to the flow chart on the next page.

It was decided to carry out a case study in order to limit the research to developing an in-depth description and analysis of cases in North Cyprus by using Levent as real-life example and various examples from internet were used to show different perspectives on the problem, process, or event. The data collection approaches as summarized by Creswell for the case-study approach of qualitative research such as using observations, questionnaires, and conducting interview were used (Creswell, 2007). So, by systematic visits to the site, carrying out a questionnaire, interviewing the architect; using photos, drawings, plans a strong basis for the study was formed. Data analysis strategy was to go through description of the cases and themes of the cases as well as cross- case themes.



Graph1. Flow-chart Methodology of Research

Chapter 2

CLARIFICATIONS OF TERMINOLOGY AND LITERATURE REVIEW

This chapter is divided into two main sections. The first section is clarification of terminology explain the architectural related terms focus on six main contemporary approaches: Green architecture, organic architecture, environmental friendly architecture, energy efficient architecture, sustainable architecture, ecological architecture. Also clarification of terminology explain the interior architecture related terms focused on six terms: Interior landscaping, interior – scaping, plantscaping, horticulture, room plants, indoor gardens/ interior gardens. This first section will clarify the concepts and the terminology forming the basis of this research. From the second section onwards, the chapter will review the literature about nature and interior space relationship under three sub-headings: Interior Architecture media, practice and kindergartens, and nature and kindergarten (interior) architecture. The first section discusses the reflections to interior architecture through media discourse, in terms of health aspects related to the positive effects of interior landscape especially on children, which related to human comfort zone; natural air, natural materials, natural ventilation, natural light, natural heating and cooling, and sick building syndrome – when the natural becomes too mechanical and chemical. Environmental psychological aspects, where there were limited sources on other things. Many articles from the Journal of

Environmental Psychology touch issues related to this subject. Positive effects of wide widows and the “view” of the user is one of the themes, which is very relevant to the topic of this study. Light is important for psychology, as well as another relevant topic is the “color”. The second section discusses the reflections to interior architecture through design practice, by showing exemplary building interiors and leading designers and products in practice. And the last section is about the relationship between nature and interior kindergarten; involve the historical background of kindergarten design and its interiors, kindergarten design standards and nature, and kindergarten architecture and nature today.

2.1 Clarification of Terminology

Lately, there are many awards for environment, nature, and resources sensitive approaches to architectural design. International companies have not only ethical considerations related to these issues; they have at the same time a hidden agenda and that is the “image” thing. It has almost become a fashion “to care for the nature”, however, when considering their relevance to “interior architecture” one has to understand the meanings of different concepts appearing around these concepts, discover their similarities and differences. The concepts to be clarified in this section are divided under two main categories: architecture related terms and interior architecture related terms. Architecture related terms are: green architecture, green building, organic architecture, environmental friendly architecture, energy efficient architecture, sustainable architecture and ecological architecture. In addition to these interior architecture related terms to be clarified can be listed as: interior landscaping, interior-scaping, plantscaping, horticulture, room plants and indoor gardens/interior gardens.

2.1.1 Architecture Related Terms

There are several concepts that need clarification for the aim of this study. The architecture related concepts will be clarified under this section.

2.1.1.1 Green Architecture / Green Building

Green architecture embraces the same philosophy with some additional points. The objectives of green architecture lead to positive outcomes like maximizing energy efficiency as well as environmental advantages and benefits for the people using the particular building. In addition to working in harmony with the natural surroundings of its buildings' setting, green architecture also uses easily-grown or recycled materials to achieve its goals. Additional benefits of a building designed through green architecture include: low energy use, low use of water and reduced amount of waste (URL 1).

Green buildings aims to reduce the waste of resources like energy and water; protect the health of the people using or living in the building; and decrease pollution as well as environmental destruction (URL 2).

2.1.1.2 Organic Architecture

The concept of organic architecture, coined by Frank Lloyd Wright in 1954, aims to create buildings that look 'natural' in their environmental surrounding (URL 3).

Wright also argued that form and function are a unified whole and everything should be grown from its natural environment (URL 4). In other words, Wright was more concerned with form and function rather than architectural style.

2.1.1.3 Environmental Friendly Architecture

Environmental friendly architecture designs buildings that are sensible to nature. All the stages that a building goes through such as design, implementation, construction, materials, maintenance, renovation or even deconstruction of a building must show a certain level of responsibility towards nature and environmental sources. Development of technology enables buildings to be environmental friendly as well as being careful about costs, functionality, durability and comfort. Some examples of this implementation include New York and Hawaii. In New York, architects use green roofs and vertical gardens to enable agriculture in city setting. And, in Hawaii, every family should use solar panels for heating purposes (URL 5).

2.1.1.4 Energy Efficient Architecture

We, as people, are becoming increasingly more aware of our responsibilities towards protecting our environment and the planet as a whole. People have a significant role in protecting the planet and with this awareness in mind; people have started to change their lifestyles accordingly. The way people eat, live, or even the way people dress has changed in a way to protect the environment. Designing and constructing buildings that are also sensitive to the environment and energy-efficient is also part of this changing world. Thus, designers try to provide energy-efficient buildings which enable a significantly less cost of energy used for heating or cooling, (URL 1) and (URL 6).

There are various successful examples of energy-efficient buildings in the world. Following are only two of those successful examples: Gimpo Art Hall and Green Residence. The first example, Gimpo Art Hall, is used as a theatre and museum. Its most

significant design feature is the pedestrian access. The building is also spectacular and unique example due to its cubic structure. Additionally, large glass openings also allow large amount of natural light inside, as can be seen in Figure 1a. The second example in Figure 1b is the Green Residence which is a family home in Austria. Its grass-covered exterior walls explore the relationship between nature and architecture. Green walls are accompanied by the green plane surrounding the home.

1a- Gimpo Art Hall, by Gansam Partners, Seoul, (URL 7)

1b- Green Residence, Reinhold Weichlbauer and Albert Josef Ortis, Austria, (URL 8)

Figure (1a and 1b): Green architecture and energy efficient examples.

2.1.1.5 Sustainable Architecture

Sustainable architecture aims sustainable buildings by using environment-friendly design methods. In simple terms, sustainable architecture aims to “minimize the negative

environmental impact of buildings by enhancing efficiency and moderation in the use of materials, energy, and development space" (URL 9).

One of the most successful examples of sustainable architecture is the Frontier Project in Southern California (Figure 2a). The building is used to inform the public and experts of the design and construction field on alternative building methods that will enable sustainability. The second most famous example is also in California- the Sustainable Architecture Home. The house uses eco-friendly materials and has several features of sustainability such as the pond around the house to cool down the air or the concrete floors to keep the house warm all the time (Figure 2b).

	
2a- Frontier Project, HMC Architects, California, (URL 10)	2b- Sustainable architecture home, by John Friedman Kimm Architects, 2011, (URL 11)

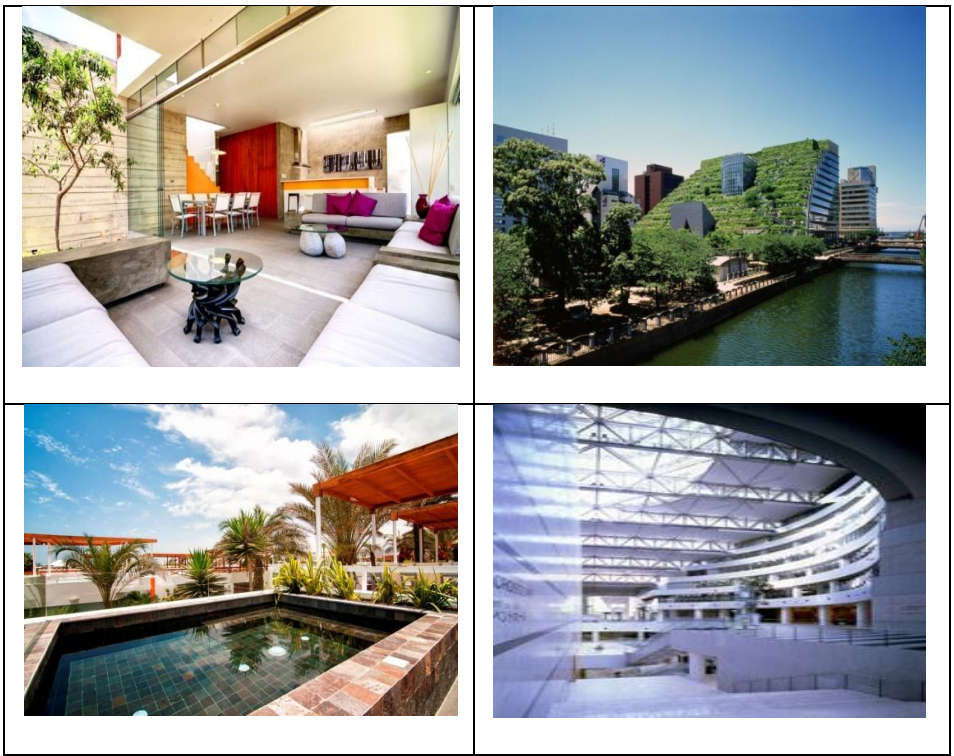
Figure 2a and 2b: Examples of sustainable architecture

2.1.1.6 Ecological Architecture

The term ecological architecture was created in 1970 with an effort to take action for the decrease in energy resources, (URL 12). Designing ecological buildings aims to maximize beneficial interactions with nature and the designer should embrace the idea

that humans have a significant role in improving and maintaining the ecology around them, (URL 12).

One example of this type of design is the Casa Seta in Peru. Plants were used inside Case Seta to highlight the link between people and nature (Figure 3a). Another example is the ACROS Fukuoka Building in Japan. The building looks like a green hill and the atrium allows the building to be filled with natural light (Figure 3b).



a) Casa Seta, Martín Dulanto, Perú, (URL 14)	b) ACROS Fukuoka Building, Japan, 1995, (URL 13)

Figure 3a & 3b: Examples of ecological architecture

In conclude from all these terms just to show how the nature interated in these architecture.

2.1.2 Interior Architecture Related Terms

This section will discuss the interior architecture related concepts such as interior landscaping, interior-scaping, plantscaping, horticulture, room plants and indoor gardens / interior gardens.

2.1.2.1 Interior Landscaping

The term interior landscaping refers to the "practice of designing, arranging and caring for living plants in enclosed environments" (URL 15). Interior landscape organizes greenery in a way that the beauty of the surrounding is maximized. Cobbled paths, plants, flowers, indoor trees can all be used based on the space. Little ponds or waterfalls can also be used as part of interior landscape design (URL 16).

"Landscape surrounding or a corporate building can enhance user‟s satisfaction and productivity. several studies, when interior landscaping is applied in a building, absence dropped by 15% to 25%, and sick-leave use was extensively reduced. On the other hand, Interiors spaces are the people‟s daily living-and working environments. Interior space are designed not only a matter of function, but also of aesthetics and emotional comfort. Therefore, interiors should successfully combine functionality and aesthetically. Landscape is complementary elements of interior volumes. Landscaping elements such as water elements or plant material have the potential to reduce average indoor temperatures to below the outdoor average, (Pakravan, 2010).

Mainly, three types of landscaping are used in interior volumes. They are live, dried or artificial landscaping. Depending on building characteristics, size, and expectations from

interior volumes, the types of plants selected and their arrangements are changed. While small size plants in pots preferred for residential buildings, big trees/plants are used for public buildings and offices. On the other hand, if there is no natural light in an interior volume, generally live plants will dry. Therefore, artificial plants are preferred in this type of spaces, see figure (4).

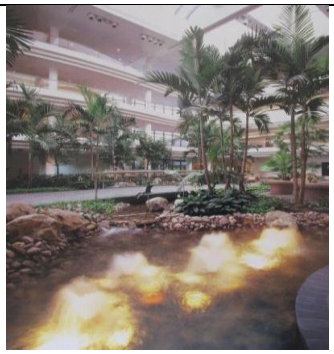
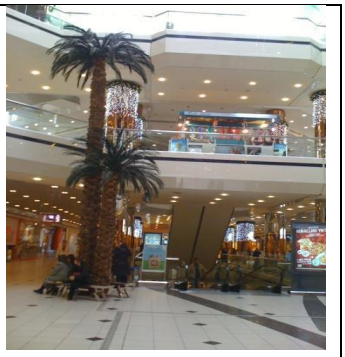
		
Small size plants	Big plants	Artificial plant

Figure 4: The uses of plants in interior spaces

The following are the basic elements of landscaping:

I) Basic coverings(*paving)*: Base covering or in other words paving is the material which covers the ground as the finishing layer to give a good walking surface.

- Carpet
- Laminate
- Wood Floor
- Ceramic Tile
- Stone

II) Plant material(visual plant characteristics):

- Plant size
- Plant form

- Plant color
- Foliage type
- Plant texture

III) Plant types could be:

- Live plant materials
- Artificial plant materials
- Dried plant material

IV) Interior décor and furnishing include the following:

- Plant container
- Interior decoration elements
- Furnishing

V) Water elements: Water can be used as an aesthetic element or it may be employed for such practical functions as cooling the air, buffering sound, irrigating the soil, or providing a means of recreation.

- Active water elements
- Passive water elements, (Pakravan, 2010).

In order to summarize, it can be said that interior landscaping is a concept focusing on the relationship between nature and interior. Interior landscaping theory can also be defined by the two previously mentioned alternative terms: plantscaping and interior-scaping. During the process of reviewing the media, it was found that there are some resources available on the interior landscaping theory but are only at an inspirational level for designer and architects. Several books have been found on this subject such as

Falkenberg's (2011) Interior Gardens; Steele's (1992) Interior Landscaping Dictionary; Appell's (2000) Landscaping Indoors: Bringing the Outside Inside. Many other resources are also available but because of their guideline nature, they are not at satisfactory level for this research.

2.1.2.2 Interior-Scaping

Interior-scaping is another type of interior landscape design that focuses on using nature in work environments. In other words, interior-scaping is the work of introducing your work place to Mother Nature (URL 17). Interior-scaping has several advantages in office settings such as improved air quality; improved work performance; reduced stress level; reduced noise level; positive image of the firm or company and leads to increased sales (URL 18).

While most source refer to the art of bringing nature in office environment as interior-scaping, Richard Gains, the author of *Interior Plantscaping* (1977), makes use of the term to highlight the difference of interior landscape office planning (URL 15).

2.1.2.3 Plantscaping

Plantscaping is another type of interior landscape design that tries to make the best combination of colours, textures and other conditions while using plants indoors. According to plantscaping principles, plants and trees should be chosen based on soil composition, light exposure, drought tolerance, mature size, colour and texture, (URL 19).

2.1.2.4 Horticulture

In simple terms horticulture is growing fruits, vegetables, flowers and crops such as spices. There are different branches of horticulture. The four main branches are: pomology, olericulture, floriculture, fruit and vegetable preservation. Pamology deals with growing fruit crops; olericulture is related to growing vegetable crops; floriculture is linked to ornamental flowers and landscaping; and lastly fruit and vegetable preservation, as the name suggests, is connected with the principles of fruit and vegetable preservation. There are also sub-branches of horticulture that can be listed as: plantation and medicinal plants; ornamental gardening; landscape gardening; and nursery plant production (URL 20).

2.1.2.5 Room Plants

Room plants or indoor plants allow designers to make rooms and spaces more natural and fresh. Room plants are generally chosen from species that can survive with limited sunlight. There are some plants that are shinier indoors. Some of these species include: the various species of palm, sanseviera, Dracena sanderiana, philodendron, sphatiphyllum, (URL 21).

2.1.2.6 Indoor Gardens / Interior Gardens

There are different tools that can be used for successful implementation of indoor gardens. One of these tools is indoor grow lights. A variety of grow light technology such as LED grow lights or high density discharge lights can maximize the effect of indoor gardens. Another tool is hydroponic gardening that is related to equipment used for growing, nutrients and media for all methods of hydroponic gardening (URL 22).

2.2 Literature Review-Nature and Interior Space Relationship

Literature review will be provided from this section and onwards until the end of this chapter. It is actually discourse review under the sub-headings of media, practice and practice of kindergarten with regards to nature and interior space dialogue. Due to the nature of the thesis format it was preferred to keep the traditional term of 'literature review' instead of discourse review. Books, magazines, Academic Journals and websites have been reviewed to explore successful examples that have been applied in real life.

2.2.1 Interior Architectural Media-Reflections

Media reflections section will discuss the health aspects, environmental psychology aspects and lastly the relationship between nature and kindergarten (interior) architecture.

2.2.1.1 Health

Integration of nature into enclosed environments has many benefits. This section will focus on the health aspects of these benefits. Plants have certain benefits on human health so they should be used for functions more than beautifying homes. The first important factor is the air in enclosed environments. The quality of air indoors is a significant health factor in design and architecture as well. Using plants while designing indoor has proven to be beneficial for health by lowering the risk of certain diseases. For example, a study carried out in offices in Norway showed that "indoor plants reduced different ailments, fatigue ratio was reduced 20 %, headache 30 %, dry throats 30%, cough 40 %, and dry facial skin 25 %" (URL 23).

There are many other researches that support the theory that nature has positive effects on people. Grahn and Stigsdotter (2003) highlight that outdoor areas that provide environments free from demands and stress, and that are available as part of everyday life, could have significant positive effects on the health. Additionally, they add that good landscape planning can contribute to creating a less stressful and more restorative everyday environment for inhabitants in towns and cities: interactions with urban green open spaces could help to physically and emotionally restore human beings. The design and the contents of the outdoor environment seem to be of importance for the recovery of a stressed person visiting the environment.

Kou, a researcher who studies the connection between nature and human health, points out that exposure to green surroundings has several benefits for humans. Kuo also coined the term “Vitamin G” (G for “green”) in order to highlight the importance of nature for humans health. Studies have also shown that contact with nature on a regular basis is needed for human health, (Natural Learning Initiative, 2012).

Most of the research in the area of the health-related consequences of excessive screen time has focused on implications related to obesity, cognitive performance, anxiety and depression. Those experiencing high levels of cyber-based information overload are much less likely to engage in contemplative activities. It remains unknown to what extent the loss of green time - time spent outdoors in nature, or at the very least, a view to nature - is itself a risk factor for mental health disorders and cognitive difficulties. Put another way, an unanswered question is whether or not the loss of contact with nature,

its displacement by the screen, removes a layer of psychological resiliency, (Logan and Selhub, 2012).

Additionally, playing freely without any limited space has wide range of benefits for children in terms of cognitive, social and health development. According to a study carried out by two physicians, especially young children benefit a lot from playing freely outdoors. Authors claim that playing freely helps with obesity in young children in terms of health; improves creativity and problem solving skills as part of cognitive development; reduces stress and teaches how to get along with others for social skills (Burdett and Whitaker, 2005).

Considering this scientifically proven benefits of playing outdoor for young children, it becomes a necessity to at least try to bring outdoors indoors where children spend most of their time. It is a must-do for kindergartens as well due to their educational function in young children's lives. Creating an outdoor setting in enclosed environments brings along may be not all but at least most of the outdoor health, cognitive and social benefits for children.

Another important health issue related to architecture is human comfort, which, as the name suggests, is how comfortable people feel in a certain environment and enclosed space. There are several factors involved in human comfort such as human physiology, heat balance, metabolism, clothing, and environmental factors. While trying to optimize human comfort certain issue should also be considered related to the abovementioned

factors such as “heat vs. temperature, body heat control, radiation, evaporation, humidity, air movement, etc.”, (URL 24).

All of the stated health issues relate to the design and architecture of a building. It is clearly proven and shown that using ‘nature’ while designing enclosed environments bring along various health benefits for people of all ages.

2.2.1.2. Psychological Effect of Viewing / Vista

Berman et al., (2008) supports the idea that benefits of interacting with nature that has psychological effects on children and teachers.

Researchers have studied the impact of viewing nature through windows on mental health more extensively. This is because windows are essential parts of buildings at which individuals spend part of their days. It is usually preferred by individuals to live or work in structures fitted with windows that allow them to view the surroundings (Finnegan and Solomon, 1981).

Further, at workplaces, people put much premium on offices with more windows especially corner offices which usually have more windows because these offices afford better and more viewing options. Even people traveling on cruise ships are charged higher fees if they wish to stay on upper deck rooms with window view. The same thing goes for lodgers in hotel room: they pay steeper prices for rooms with interesting views. It is also common for people to locate their houses on mountains and near oceans without minding the associated risks because of the natural views such structures offer.

Having a window with natural view is more than a whim of individuals. Researchers have documented its importance. In general, these studies indicated three levels of engagement including viewing, being and involvement with nature which positively impact health (Pretty, 2004).

Nevertheless, few studies have focused on the effectiveness of viewing nature through window on human health. In the further sections of this paper, summary and analysis of studies dealing with viewing nature through windows will be provided. These include viewing nature through windows in residential settings, institutional settings and workplaces. (Abkar, 2010).

2.2.2 Interior Architecture Practice-Reflections

Interior architects and designers from all around the world are following two major websites: Architonic and Stylepark. In recent years, these two websites highlight the significance on interior landscaping and thus, manufacturers design their products accordingly and publicize on the same websites. This section of Chapter 2 will focus on the examples of the practice and leaders in the field. The first part will provide successful application examples; and the second part will provide information on leading designer and pioneering products of the field.

2.2.2.1 Exemplary Building Interiors

The first successful example of interior landscaping is the *Green Botanical Shop* in Brazil, as shown in (figure 5). The shop was planned to be used as a place for selling plants and gardening tools. (Jodidio, 2012).

Green Botanical Shop, Architect**s:** Maria Paz and Thomaz Regatos from Rizoma, in Brazil, 2011, (URL 25)

Figure 5: Green Botanical Shop

The second example is the *S.T.A.Y. and Sweet Tea Restaurant* in Beirut designed by Green Studios as shown in (figure 6). It was designed by using an outdoor courtyard and vertical gardens. (Brooker, 2010).

Restaurant, Moatti-Riviere, Lebbanon, 2011, (URL 26)

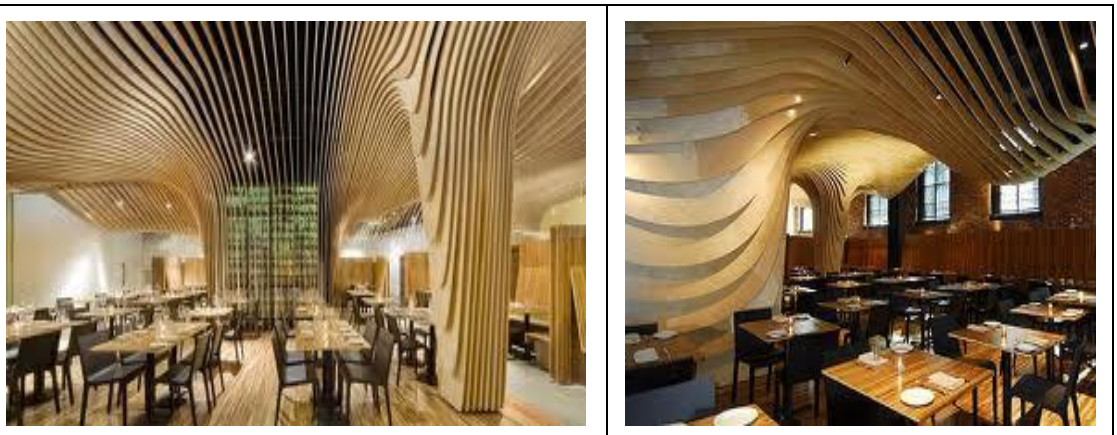
Figure 6: S.T.A.Y.and Sweet Tea Restaurant

The next example is the *Kinderdentist Mokaberri* in Berlin. The walls of the building are in blue and and the wall connects three levels of the building (Brooker, 2010), as shown in (figure 7).

Kinderdentist, Design by Graft Lab Architects, Berlin, Germany, 2008, (URL 27)

Figure 7: Kinderdentist in Germany

Banq Restaurant in Boston is also another successful example and its design gives the impression that the indoors is "floating like a cave in nature" (Brooker, 2010).



Banq restaurant, Boston, USA, Design Office dA, 2009, (URL 28**)**

Figure 8: Banq restaurant in USA

Another example from Brazil is the *Numero Bar* designed by Isay Weinfeld. The entrance reminds of a temple or a cave and the two main areas are designed in contrasting ways: the main hall has high-ceiling and the basement has a low-ceiling.

Despite their contrasting design both spaces has large windows that face a tropical back garden (Jodidio, 2012).

Numero bar, Design by Isay Weinfeld, Sao Paulo, Brazil, 2010, (URL 29**)**

Figure 9: Numero bar, Location: Sao Paulo, Brazil

Architects

This section will provide information on the leading architects related to the subject of this study. There have been many architects and designers focusing on interior landscaping and highlighting its importance in their works. Thus, manufacturers started to work to meet the increasing demand for appropriate products and widen their range of products accordingly.

Kengo Kuma is the first architect example who majored in architecture in Tokyo. He aims to restore traditional Japanese buildings and adapt them for the current century but he also works hard to highlight the importance of light and nature in the field of architecture (URL 30). He designed a hotel in Miyazaki with the concept of a ‘calm and tranquil environment’ and provided wonderful scenery by using bamboo trees and pools of water.

Bamboo is planted and water is laid out in and out of the hotel and its courtyard, (URL 31)

Figure 10: Hotel in Miyazaki

The second architect is also from Japan and his name is Toyo Ito. He tries to express physical and virtual worlds at the same time, (URL 32).

He designed the *Tama Art University Library* with an open space on the ground floor. He also invites the real nature indoors by allowing the people to see the trees surrounding the building.

Tama Art University Library, Toyo Ito, Tokyo, 2007, (URL 33)

Figure 11: The reflecting surfaces of the sinuous tables drag the nature inside

2.2.2.2 Leading Designers and Products in Practice

This section will introduce leading designers and products used in practice. In addition to architects, designers and products also play a crucial role in designing interiors.

Designers

After the architects, we will now focus on the leading designers of the field. Six designers will be introduced along with the highlighted products they use. The first designer is Jean-Marie Massaud. He is from France and he is not only a designer but also an architect and an inventor, **(**URL 34).

He prefers to use vertical blinds with green grass as curtain and vertical green walls.

	
Curtain – Vertical Blinds with green grass print, (URL 35)	Green wall vertical, (URL 36)

Figure 12: Objects and Elements, Design: Jean-Marie Massaud

The second example is a designer team- Ronan & Erwan Bouroullec. The team is formed by two brothers from Brittany. They have used treille that can be seen in the figures below. Treille is formed by horizontally positioned cylindrical vases connected together (Figure 13 a). The treille planter is (Figure 13 b) was designed the designer team of Bouroullec brothers.

	
a) Treille: Designer Ronan & Erwan Bouroullec Material Cast Terracotta + Nylon + Painted steel , (URL 37)	b)Bouroullec brothers' Treille for teracrea, (URL 38)

Figure 13: Teracrea for greenery

Teracrea play a leading role in architecture and contemporary interior design. It was set up in 2002, and it is a part of one of the world's leading manufacturers of flower and plant pots (Deroma Group) . A highly structured, tangible company, and at the same time, a visionary laboratory. Teracrea has become the focal point for a group of architects and landscape designers who profoundly believe in the project and put themselves, all their creativity and their desire to pursue new paths in project design to the test. The aim is to redesign the environments to make them more attractive, more alive and dynamic. And also to give design a new dimension and a new role which is conceptual but not highbrow, extremely refined and complex, yet always warm and spontaneous. The following are Teracrea's designers: Ronan & Erwan Bouroullec, Fernando and Humberto Campana, Konstantin Grcic, Marco Ferreri, Fabio Bortolani, Sebastian Bergne, Edouard François, Marion Pierret, Patrick Blanc, Fulguro, Alexis Tricoire, (URL 42).

More products of Teracrea for greenery is shown in (figure 14) below:

<table>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Releaf</td><td>Recover</td><td>Balconcino</td></tr>
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<tr><td>Chop</td><td colspan="2">Chip</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td colspan="2">Airplant</td><td>Labirinto</td></tr>
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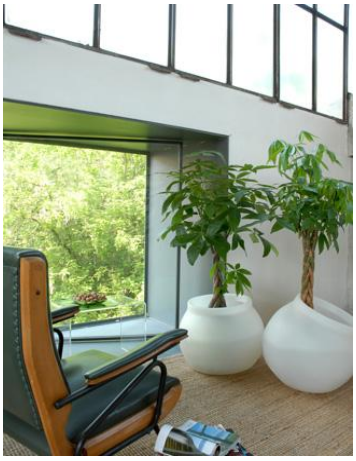
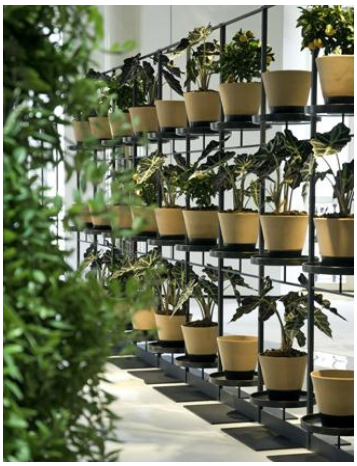
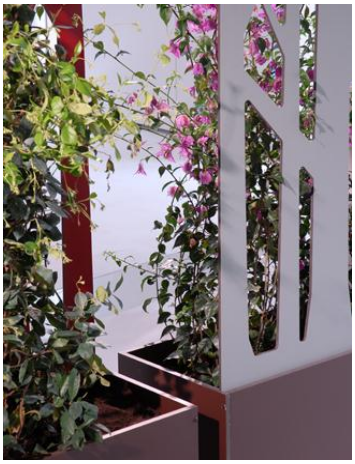
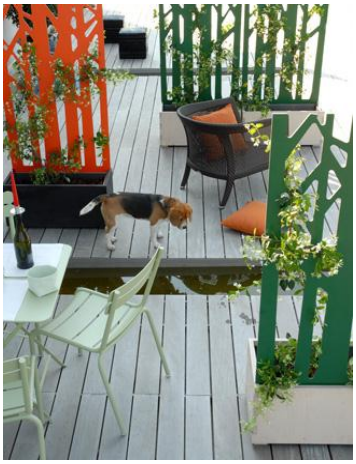
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td colspan="2">F(l)atpot</td><td>Junior</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td colspan="2">Infinito</td><td>Senior</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td colspan="3">Family-Pot</td></tr>
</table>





Separetor



Treille



Tuttisuperterra

TV

Figure 14: Teracrea for greenery products, (URL 42)

Philippe Starck, the next designer is also from France and is famous for his designs in a variety of fields starting from interior design to household products and to watches. Philippe Starck worked as an architect as well (URL 39).

The next designer is from Spain, Patricia Urquiola. She designed the swing chair furniture in a way that it became usable in outdoors as can be seen in (Figure 15a), (URL 40).

Another designer from Spain is Marco Ferreri. Ferreri chooses to use tuttisuperterra which is a type of brick that is used to construct green walls as can be seen in (Figure 15b).

	
a) Swing Chair designed by Patricia Urquiola, 2011, (URL 41).	b) Tuttisuperterra Designer Marco Ferreri, Material Fiberglass, (URL 42).

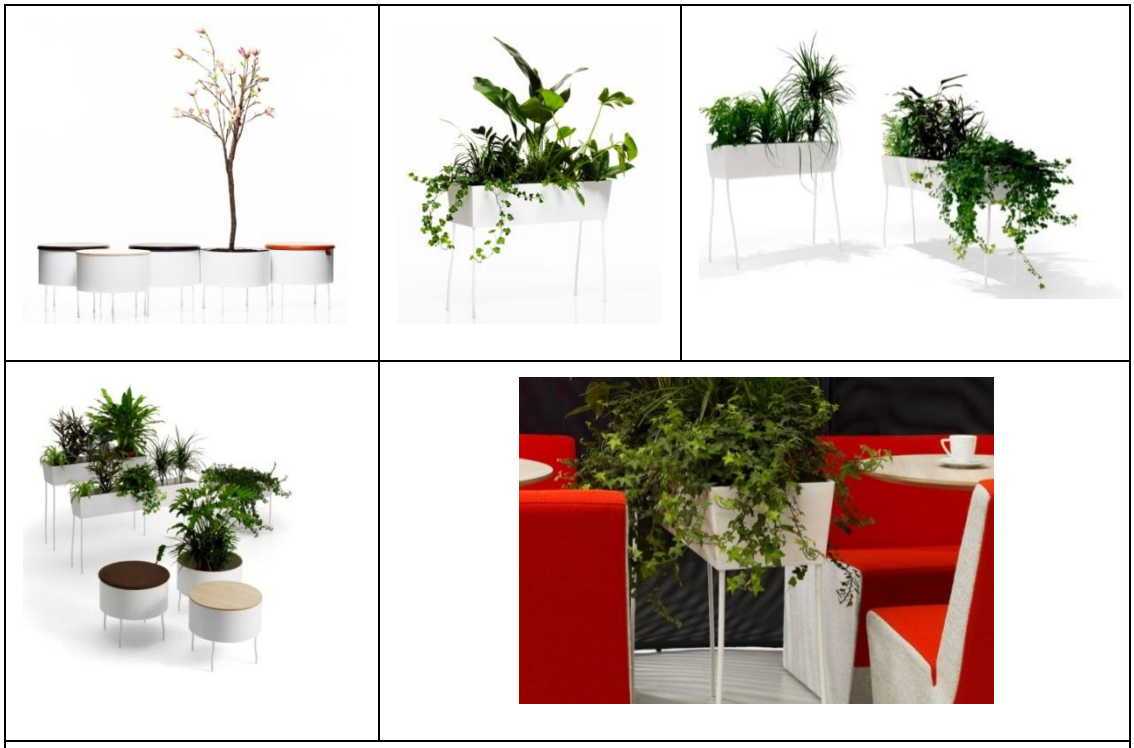
Figure15: Swing chair furniture and green walls

Louise Hederström is a Swedish designer who used the green divider in co-operation with the manufacturer Offecct. The green divider allowed Hederström to use greenery in office environments and create a certain level of open space. (URL 42).

Green divider, Design: Louise Hederström, Stockholm 2012, (URL 43)

Figure16: Green divider

The manufacturer company Offecct also uses green pedestals to enable situating the plants on higher mediums. Green pedestals can also be used as dividers.



Green Pedestals, Design :Front, Stockholm 2011, (URL 44)

Figure 17: Green Pedestals

		
VONDOM Adan Design: Teresa Sapey, 2012, (URL 45)	VONDOM Torre Cuadrado Design: Studio Vondom, (URL 46)	FLORA, Mercato, (URL 47)

Figure18: Collection of high quality flowerpots

Products

Finally, the rest of this section will introduce the leading products preferred by architects and designers. First products is the green wall that is a modular shelf system made of wood that can be used for displaying plants or for growing vines. It can also be used a divider.


Inspired by the concept of vertical garden, green wall was brought out to our current lifestyle, (URL 48)

Figure 19: Green wall demark award, Thailand , designer MR. Atsushi Koike, 2009

There are also several products by Greenworks used in interior landscaping. Some of these products are plant walls, greenscreens and babylones.

		
Plant Walls, Greenworks, 2011, (URL 49)	Greenscreen, Manufacturer Greenworks , 2011, (URL 50)	Babylone, Greenworks, Alexis Tricoire, 2011, (URL 51)

Figure 20: Plant Walls by Green works

Permalink also has products like factory planters that are a great option for having simple greenery indoors.

These planters are excellent excuse to get some greenery, (URL 52)

Figure 21: Factory Planters, Permalink, 2008

In (figure 22), it is possible to see three more products: Grüne Wand, indoor greenhouse and Orto Volante Suspension Lamp.

		
Grüne Wand by art aqua, (URL 53)	Indoor greenhouse by Arclinea, (URL 54)	Orto Volante Suspension lamp by Verde Profilo, (URL 55)

Figure 22: Indoor greenhouse products

The next line of products is the bathrooms. These products bring people closer to nature as well, (URL 56).

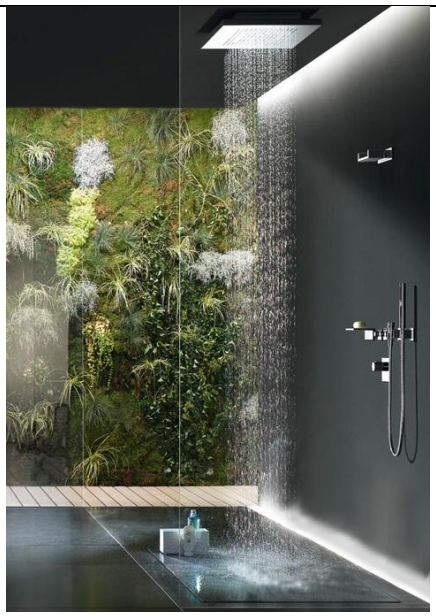
	
Showering in rainforest atmosphere, (URL 56)	Bathroom Bubble, the bathroom as a retreat, (URL 56)

Figure 23: Bathrooms concepts, by Thomas Wagner

2.2.3 Nature and Kindergarten (Interior) Architecture

This last section of Chapter 2 will discuss nature in relation to kindergarten interior architecture. The section will start with the historical background of kindergartens followed by kindergarten design standards and finishing off with kindergarten architecture and nature in today's world.

2.2.3.1 Historical Background

To start with, the word 'kindergarten' can be related to Frobel. He used to term in its literal meaning as garden for children. He aimed to care for children like seedlings in these buildings (Hoffman, 2008, p.248).

Actually, the first kindergarten in the United States founded in Watertown, Wisconsin, by Margarethe Meyer-Schurz in 1856 was conducted in German. Elizabeth Peabody had established one in Boston in 1873. But, as mentioned above, the first kindergarten in the world was founded by Friedrich Froebel. Friedrich Froebel was known as the "Father of Kindergarten" because he developed the first kindergarten in Germany in 1837 (Colliers). His kindergarten developed theories and practices that are still being used today in kindergarten classrooms. His ideas were that children need to have play time in order to learn. Kindergarten should be a place for children to grow and learn from their social interaction with other children.

The first kindergarten was established to help children of poverty and who had special needs. In 1872, kindergartens gained support from the National Education Association, which in 1884 established a department of kindergarten instruction, (URL57).

Froebel began his educational institution in 1817 but did not arrive at the organized system we see today until approximately 1837. He had worked in the Swiss school of Johann Henrich Pestalozzi and conferred with other educational thinkers of his time. Froebel devoted his life to educating children and developing the methods to maximize human potential. Froebel was greatly influenced by the work of German Romatic philospohers Rousseau and Ficte, as well as ancient Greek thinkers, and had been exposed to Taoist and Buddhist teachings.

Frank Lloyd Wright, Buckminster Fuller, and many other notable architects and artists were educated with the Froebel Gifts. Wright's connection to the Gifts is well-documented and he was a lifelong champion of the method, even constructing a Kindergarten for his own children (and others in the neighborhood). Buckminster Fuller developed his geodesic dome as a child in the Kindergarten. More than an opportunity for creativity, the Kindergarten provided Wright and Fuller a foundational philosophy for design, shaping their views of nature, pattern, and unity.

The Bauhaus artists used Gifts & Occupations, creating the new language of modern art. Paul Klee, Vassily Kandinsky, Piet Mondiran, and others were either educated in the Kindergarten as children or were trained Froebel Kindergarten teachers. They utilized these materials and adapted the philosophy into their Bauhaus design school, (URL58).

2.2.3.2 Kindergarten Design Standards and Nature

Even though, there is no specific theoretical work, which provides guidelines for kindergarten architecture/design, there are several authors like Dudek and books like

Neufert which provide at least some measures for required basic sensitivity. These do not relate any standards or guidelines directly to nature, however, some of them by default include the “nature” dimension within them.

In orderd to provide some examples, this study takes the guidelines presented by Dudek as a basis. According to him, such standards, whether for internal rooms or external areas, which should be taken in consideration can be summarized as below.

Versatility and flexibility: The rooms in a kindergarten should be serving their main purpose (group room, additional room for quiet activities, staffroom, gym, washrooms and toilets etc.) they can also be used for other activities.

Narrow hallways are impractical, for example, because, although they provide access to the group rooms, they are too cramped to accommodate an assembly of all the children. (I'm not recommending a large, broad hallway as a gym to economise on a dedicated leurythmic room'). In principle, rooms should not be too specialized but should also be suitable for other purposes (a washroom, for example, could also be an area where children might play with water.

Interconnection and openness

A large foyer or entrance hall and other rooms (office, staff room, parents' interview room) and units in the external grounds should be built as clearly differentiated units in which the children and other users may also feel apart. However, they should interconnect with adjacent units rather than being shut off from them. Users of the

building (children, teachers and parents) should feel separate but not enclosed. This can be achieved by using glass, interconnecting pathways and bridges linked to the outside. The following interior rooms are absolutely necessary:

- One room for each group.
- One separate additional room belonging to the group, preferably linked with the group room.
- One large assembly hall.
- One room per group for resting and sleeping.
- One room for PE, gymnastics, eurythmics etc. (shared by all groups).
- One washroom for each group and separate toilets for each group.
- A kitchen suitable for the children to use.
- Room for special activities such as language training and development, internet and PC.
- An administrative office (if possible with a view of the entrance, playgrounds and interior).
- Staffroom for relaxation, discussions, consultations, work preparation and marking; toilets for adults (if possible, separate toilets for staff and other adults).
- Outside: storage and maintenance area for the children's equipment (scooters, bicycles, etc.).
- All rooms and facilities (inside and outside) are to be designed and equipped to modern standards and with a view to adequate visibility (lighting; daylight whenever possible), and audibility (acoustics; effective noise insulation on ceilings and walls and suitable floor covering, e.g. cork).

- plenty of room to present the children's lartwork' and spaces for the use of parents and public (notice boards, cork walls, display windows and showcases, advertisement pillars, etc.).

The external grounds are sometimes described as open areas, gardens or playgrounds. (Landscape-) Architects should think along pedagogical lines and plan according to the life-related approach, and should ideally include:

- Hills, slopes, mountains
- Secluded niches
- Campfire corner
- Water feature
- Pond:
- Culture corner
- Building site
- Balancing corner
- Mud pit
- Playhouse
- Lawns:
- Meadow:
- Nesting boxes
- Igloo or tunnel.
- Terrace: Should flow into the group room, if possible with a planted
- pergola
- Sand pit

- Trees
- Scooter track
- Garden: Children should have their own little garden in which they can cultivate themselves and watch and learn how things grow. A kindergarten or nursery school may also have a flower or vegetable garden, raised bed, herb garden etc.
- Hollow
- Compost heap
- Ropeways
- Swing
- Earth mound
- Sensory trail

(Dudek, 2007, p.p.48-49).

Lighting Design:

The presence of daylight in educational buildings plays a significant role in the process of learning. One of such major studies' analyzed test scores of more than 21 ,000 students in three school districts in three different US states, namely California, Colorado and Washington. The following results were obtained:

• Students in classrooms with the most daylight progressed 20% faster on math tests and 26% faster in reading tests

• Classrooms with the most window area were associated with a 15-23% faster rate of improvement

• Classrooms with skylights were associated with a 19-20% faster rate of improvement

• Classrooms with operable windows were associated with a 7-8% faster improvement in three out of four cases that have been investigated when compared to classrooms with non-operable windows.

Fenestrations systems must be sized and placed to account for the dynamic characteristic of daylight. Sunlight the direct component of daylight is the most dynamic. It can be harsh, and it can create shadows as well as extreme disparities in luminance levels inside a room. It can also produce visual discomfort and glare if not controlled properly.

Day lighting systems are of two general categories:

1. Top-lighting systems where daylight is distributed inside the room from the ceiling or the roof;

2. Side-lighting systems where daylight is distributed from the sides of the room.

Studies have shown that successful day lighting principles are:

• The building should be elongated along an east-west axis. Daylight apertures can be placed on the north side where diffuse daylight is available and the south side where it is relatively easy to control the sunlight in winter and summer.

• Apertures placed high in the wall such as c1earstoreys or tall side windows optimise daylight distribution and bring light deeper into the space.

• Bringing daylight from two different directions reduces the chances of discomfort glare and evens out thedaylight distribution.

• Use indirect daylighting to control sunlight inside the classroom. Direct sunlight inside a room can cause glare and discomfort.

Side windows

For example, a classroom with a ceiling height of 3.5 metres and desk height of 0.75 metre, if the top of the window is 2 metres above desk height. the area that is adequately daylit is approximately up to (2 x 2.5 metres) 5 metres deep from the window wall. (Dudek, 2007, p.p. 34-38).

The above, references were related to the design of kindergarten architectural spaces, from the perspevtive of designers. However, there is another perspective and that one is the one related to nature and environment. LEED, which is includes a pack of "rating systems for the design, construction and operation of high performance green buildings, homes and neighborhoods" (URL 59). Leadership in Energy and Environment Design is formed by the U.S. Green Building Council (USGBC) in 1993 and it aims "to provide building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions" (URL 59).

There is standardization procedures followed all around the world for LEED certification of buildings. The assessment criteria used for existing building has seven categories: Sustainable sites; water efficiency; energy and atmosphere; materials and resources; indoor environmental quality; innovation in operations and lastly, regional priority. According to Green Existing Schools Project Management Guide, each of these categories deal with different issues related to architecture and interior architecture. First category, sustainable sites assesses strategies used for maintenance in terms of their sensitivity to plants, wildlife, and water and air quality. Water efficiency evaluates methods used to lower water usage. Thirdly, energy and atmosphere category checks for performance approaches used to save energy, to reduce pollution, etc. Fourth category,

materials and resources, checks for effective waste management and responsible procurement. The next category, indoor environmental quality deals with indoor air quality, air change effectiveness, occupants' health and comfort, and air contaminant management. Innovation in operations relates to innovative technologies, methods, project planning, and project execution. Last but not least, regional priority deals with environmental concerns for different regions of the country (Van Der Like, 12).

2.2.3.3 Kindergarten Architecture and Nature Today

This section shows two examples of kindergarten designs from Tokyo and Bali. These examples focus on natural designs and highlight the important role of nature for development of children.

- *Fuji Kindergarten in Tokyo*

This kindergarten designed by the architects Takaharu and Yui Tezuka in 2007 in Tokyo, Japan. It has 19 classes for 620 children. The concept of the kindergarten was that "a kindergarten building is a huge playground for children's growth, a tool for fostering children." The directions horizontal and vertical between the courtyard and the rooftop for moving children help them to build their strength. Three large zelkova trees have been intelligently included to serve these purposes: respect for nature; provide yet another option for ascending the facility; and remove psychological barriers between inside and outside. The outer circumference of the large one-story halo-shaped building is 183m, and the inner is 108m, (URL 60).

Courtyard and terraces, (URL 60)

Figure 24: Fuji Kindergarten in Tokyo, Japan, designed by Takaharu and Yui Tezuka, 2007

- *The Green School Bali*

John Hardy and his wife conceived of the 'green school,' an educational village community amongst the jungle and rice fields of bali, to spread their sustainable altruistic message through an alternative education system to people "they called on Balinese practice PT Bamboo Pure; to work out the technical design aspects of the entirely bamboo structure". Wood was utilized to benefit from the potential of all its properties to become structural, decorative, recreational, used as flooring, seating, tables and several other fixtures (UR L 61) , see figure (25).

Figure 25: The Green School Bali in Indonesia, (URL 61)

These two examples of kindergarten show a good relationship with nature through courtyard, terraces, big windows, skylight. As well as the natural materials (wood) that had been used in the green school Bali.

Chapter 3

ANALYSIS OF TEN SELECTED CONTEMPORARY KINDERGARTEN EXAMPLES

This chapter is divided into three main sections. The first section will explain the method of analysis followed by the second section on the details of the evaluation criteria. The evaluation criteria will be followed by the analysis tables of the ten kindergarten examples from different parts of the world. The analysis of the ten kindergarten schools are only on paper and the analysis criteria is formulated by reviewing two books the first one is what is interior design? by (Brooker and Stone, 2010).

This part is the point where the foundation and backbone of this study is formulated. After reviewing successful examples around the world, these had been chosen with the aim of showing different locations, different cultures, and years of construction. Some elements are determined to be crucial for the analysis of kindergarten interior architecture. Pulses of the global interior design market and network have been checked by going through online forums and contemporary approaches.

3.1 Method of Analysis

This section provides the analyses on ten kindergarten examples and their analysis criteria for trying to understand the relationship of their interior spaces with nature. The

criteria have been prepared by the researcher based on the key terms aforementioned in this chapter. This was a crucial step in this study, as the same analysis criteria was used to evaluate the real-life case study which is explained further in chapter 4.

However, before coming down to the evaluation criteria, several prior steps have been followed to ensure a beneficial outcome. The first step was reviewing the contemporary examples of successful kindergarten designs that lead to the second step on finding out about the dialogic elements with nature that stood out in the reviewed designs. At the beginning, there were 28 kindergarten examples that have been found however; due to their poor connection to nature some designs of the initial examples were shortlisted. As some other kindergarten did not fit to the purpose of this study, they were eliminated as well and the final list of example kindergarten designs decreased down to ten. The list of the initial 28 schools can be found as Appendix 1, and the final list of kindergartens that have been evaluated is below:

1. Prototypical Kindergarten
2. Le Petit Prince Nursery School
3. Forscherkindergarten Apfelbäumchen
4. Timayui Kindergarten Preschool
5. Fuji Kindergarten
6. Sighartstein Kindergarten
7. Nursery School in Berriozar
8. Kensington International Kindergarten
9. Loop Kindergarten
10. Pajariro Jardin Infantil La Aurora Kindergarten

The third step was to explain those dialogic elements, as can be found in Chapter 2. After explaining the elements, the final step was to categorize the same elements under four main categories: planes, surfaces, objects and light. This categorization was done according to the book of *What is Interior Design?* written by Brooker and Stone (2010). The case study of Levent kindergarten which integrated nature in their interior architecture was evaluated based on the criteria below that was inspired from the book *What is Interior Design?*:

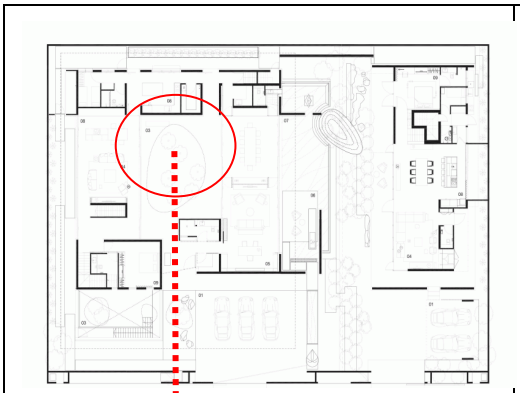
- Architectural criteria: courtyard, terraces, and green roof
- Interior architectural criteria: planes, surfaces, objects, and light

3.2 Evaluation Criteria

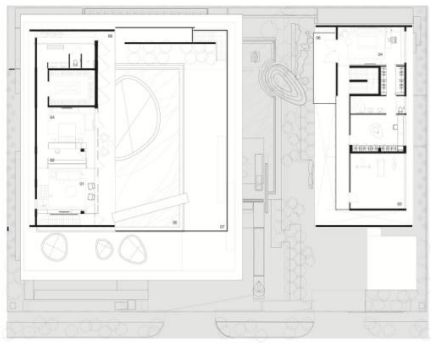
Brooker & Stone (2010) elaborate on the elements of interior design however the ones related to the subject of this study were chosen. The criteria was divided into different sections such as architectural criteria and the interior architectural criteria that had sub-elements.

3.2.1 Architectural Criteria

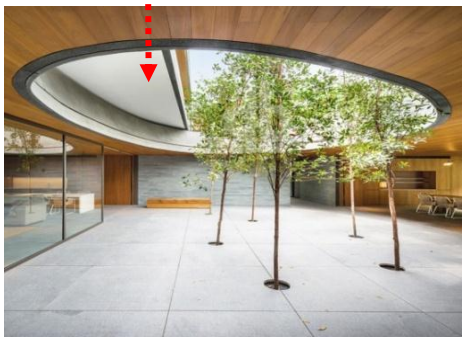
The first element of architectural criteria is the indoor courtyards. Courtyards allow designers to create a sense of being outdoors with privacy. First example of indoor courtyards is the *Farm* which is centered courtyards that connect to separate parts of a house as can be seen in the figure below:



Ground Floor



First Floor

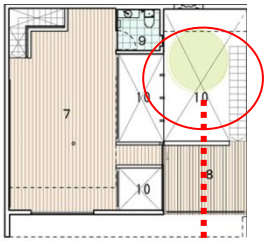


The Courtyard, and Large green piazza and water feature, (URL 62)

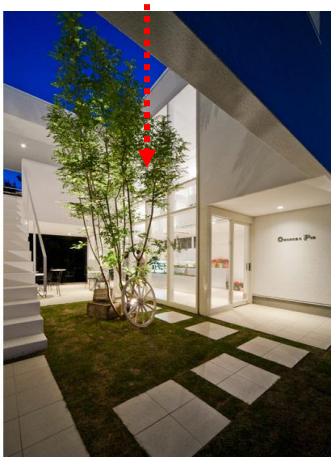
Figure 26: The Wall House, Farm, 2013

The second example for courtyard is the *George's pie* in Japan. The illustrations of these buildings are below:

Ground Floor



First Floor



Patio and Balcony has seats for seating in the courtyard, (URL 63)

A small courtyard bounded by stairs and a foot path evokes movement in contrast to the sedentary nature of the patio beyond, (URL 63)

Figure 27: George's Pie, Kenji Yanagawa and Associates, Japan

Another element of architectural criteria is terraces. The architect Domenic Alvaro has received the world architecture festival award for best house of 2011. The Small House in Sydney constrained within a 7 meter by 6 meter footprint, this compact site divided between five levels. A study area at the roof terrace is enclosed with glass and may be

joined to the vegetation through sliding doors. The roof terrace gives indoor more natural light and connection with nature through big windows.

Roof terraces with plants, large slid door and window, (URL 64)

Figure 28: Roof Terrace of the Small House, Domenic Alvaro, Sydney in Australia, 2011

The next element is the green roofs, this element refers to a roof of a building that is partially or completely covered with vegetation in addition to that there is a drainage and irrigation systems. Green roof became a popular trend in the last few decades, recognized now for their ability to reduce the heat effect, while also reducing heat loss and energy consumption in winter months. Example of this element is the U*ndulating Green-Roofed School* in France:

In addition to creating a healthy, green space, the architects have created a genuine ecosystem, (URL 65)

Figure 29: Green School, France

3.2.2 Interior Architectural Criteria

The elements mentioned in this section are categorized under four main headings: planes, surfaces, objects and light, respectively. Several examples and illustrations are provided in this section for each element as it is crucial to clarify these elements because they form the analysis criteria.

a. Planes

Either vertical or horizontal planes allow designers to create new functions and purposes within a certain space. An example of planes can be the horizontal plane in the Quarter Museum in Vienna designed by Propeller Z (Brooker, 2010).

The vertical plane slides from within the information centre and elegantly announces itself in the courtyard, (URL 66)

Figure 30: Basis Wien, Propeller z, Einbau , Austria, 1998

Vertical gardens can also be categorized as planes in interior landscaping philosophy. Below are a couple of examples to show this. The first example is a vertical garden used in a boutique in France:

The garden seen from the second floor, (URL 67)

Figure 31: Store in Florence, Architect Studio 10, 2009

The two examples in the illustration below are from the toilets of a hall in Stockholm:

Vertical garden in Stockholm, 2010, (URL 68).

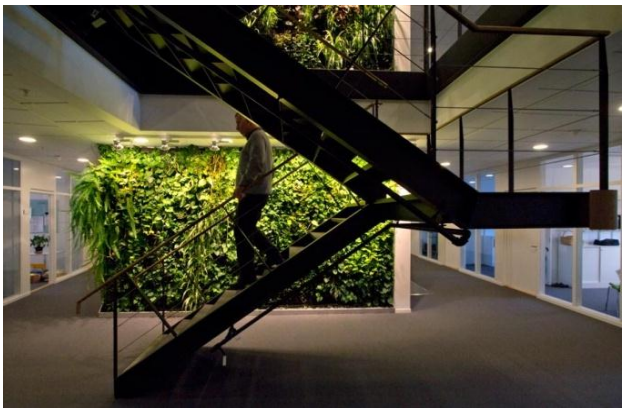
Figure 32: International Fairs, Stockholm, Architect Rosenbergs Architecteure, 2010

Another example is the Rica Talk Hotel in Stockholm that has an irregular vertical garden with openings to allow visitors pass through.

Vertical garden in Stockholm, 2006, (URL 69)

Figure 33: Vertical Garden, Architect: Rosenbergs Architecture, Interior Architect: Marge Architecture, Stockholm, 2006

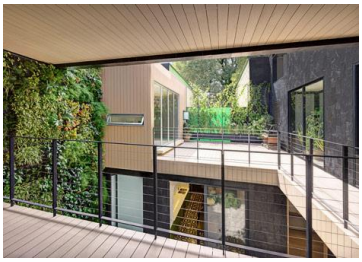
The next example is in *Malmö University* that has a vertical garden at the background of each set of stairs on three floors:

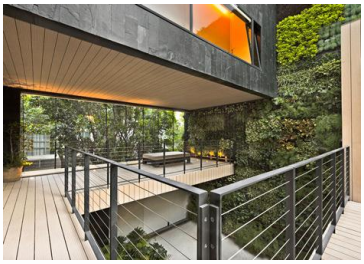


Green walls, (URL 70)

Figure 34: Green Walls at Malmö University, Architect: Mono Architecture, 2011

Cormanco House in the Paul Cremoux Studio has three vertical gardens and real plants were used to moderate room temperature.





Vertical garden, (URL 71)

Figure 35: Cormanca House, Paul Cremoux Studio, Mexico, 2012-2013

b. Surfaces

Surfaces can be explored in terms of materials used, texture and choice of color. According to Dodsworth (2009) there are some fundamental materials used for surfaces: stone, wood, metal, and glass. While stone and wood give a sense of authentic link to earth; metal and glass can be more practical and provide a sense of modernity. Texture basically covers features like solidity, reflectivity, translucency and transparency, (Dodsworth, 2009). Following are two illustrations to show texture and material.

	
Texture: plants, (URL 72)	Materials, (URL 73)

Figure 36: Examples of Interior Spaces Elements Texture and Material

The third heading to evaluate surfaces is the color. Colors have more influence on our lives than we are aware of. Color can reflect the mood or can change your current mood. This is why Dodsworth (2009) highlights that designers should be aware this enormous power and be careful on the use of colors.

	
Color of water in the interior spaces, (URL 73).	Color of flowers, (URL 74).

Figure 37: Color of Water and Flowers

c. Objects

Objects can be explored as elements or furniture. Anything that fits to the whole natural design concept can be used as an element like water, greenery, etc. however, as Dodsworrth (2009) mentions furniture is determined by the needs of the space and individuals. Furniture can either stand free or be connected to other furniture or space. The following illustration shows the use of water as an element and flower pots as furniture.

	
Water as an element, (URL 73)	Plants pot as a furniture, (URL 23).

Figure 38: Water Elements and Plant Pots

Indoor plants are another type of object that can be used to invite nature in enclosed environments. As it was mentioned in the previous chapter, plants have lots of benefits for human health and psychology, thus it would not be proper to use them for designing purposes as well. Following are only a few of many examples to show how plants can be used:

	
Indoor plants considered as an objects, (URL 75)	(URL 76)

Figure 39: Indoor Plant

	
(URL 74).	Interior Gardens of WIPO's New Building, (URL 76)

Figure 40: Interior Gardens

Interior landscaping is significantly different from the landscaping done outdoors. People would like to enjoy greenery both indoors and outdoors but the effect is the same in both cases. Potted plants are the simplest elements that can be used for interior landscaping. Following is an example of interior landscaping.

Interior landscaping in interior spaces, (URL 75)

Figure 41: Broadway Penthouse, by: Joel Sanders. New York, United States

And last but not least, is the green art wall as an object. Also known as living walls, green art walls are very helpful in creating natural designs and they are self-sufficient vertical gardens **(**URL78).

Following are two different types of green art walls:

Green art wall, (URL 79)

Green art wall, (URL 80)

Figure 42: Green Art Wall in Interior Design

d. Light

Lighting and color are directly linked so they should be considered together while designing a space. The effectiveness of the light or the colors around or colors coming from the light is factors that should all be considered while designing. However, considering the subject of this study, it is possible to say that the most important type of light is the natural light. Interior landscaping should allow natural light reach indoors for a variety of reasons but most importantly for human health. It is possible to see in the illustrations below, the various ways (big windows, and skylight) for allowing natural light indoors:

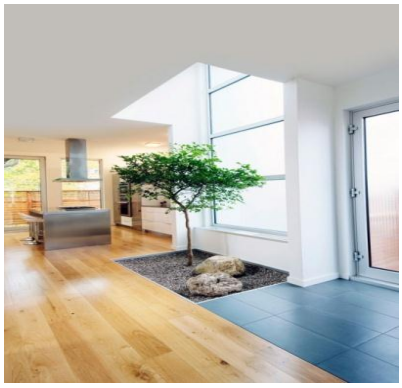
<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Light: by windows, (URL 73)</td><td>Skylight, (URL 81).</td></tr>
</table>

Figure 43: Natural Light through Windows or Skylight

3.3 Analysis Tables of the Examples of Kindergarten from Different Countries

In this part of the chapter, ten examples had been chosen from 28 of contemporary approaches of kindergarten the more related to the nature from different countries, different year of constructions, and different architects. All these examples had been taken from the World Wide Web, to be analyzed according to the criteria that derived from books; both the architectural and interior criteria. Here is some general information about each approach of kindergarten:

- *Prototypical Kindergarten*

The quality and joyfulness of a circular shape of the plan with the courtyard is an ideal form for a kindergarten. It lies in its immanent clarity and comprehension, also a sense of being included, accepted, and protected The simple circular building with logical and uncomplicated concentric organization creates a safe space for children, also to teachers and parents, (URL 82).

- *Le Petit Prince Nursery Sschool*

The architect is Carlos Barba the building is located in France and built in 2011; there is one class extension for 12 children. The building features curved with an undulating roof, wood-paneled walls and a sloping green roof. The windows are ranging from very small windows and very large windows in relation to existing trees with high stem in the garden, (URL 83).

- *Forscherkindergarten Apfelbäumchen*

Designed by WINKENS architect in 2011, its located in Neptunstrabe, Berlin in Germany consist of 4 classes which serve less than 3 years 22 children, and over 3 years 23 children. Two symmetrical sides of the building each includes kindergarten and the other side is crèche, the central foyer is between these two sides. By considering the special conditions of the small hill and the trees the linear one floor building was set orthogonal to the Neptun Street, (URL 84).

- *Timayui Kindergarten Preschool*

Designed by El Equipo de Mazzanti, in 2011, located in Santa Marta, Colombia. There are 2 classes in each cluster and art room for 350 children. The three concrete blocks that comprise each module contain bathrooms, two classrooms and a flexible open room, which surround each central courtyard like the petals of a flower, (URL 85).

- *Fuji Kindergarten*

Refer to chapter 2 page (38) the Fuji kindergarten was explained more.

- *Sighartstein Kindergarten*

Desined by Kadawittfeld architecture's in 2008-2009 located in Salzburg, Austria. A kindergarten integrated into the landscape like a chameleon (including a crèche) for 4 groups. The sculptural, stylized-grass façade, surrounded, by meadows and fields, and it also curtain. The kindergarten on the ground floor has access to the gardens, and a crèche is on the first floor. Children learn by playing – and when they can do this in a

relaxed atmosphere, quiet and fully concentrated, we lay the foundation for every form of learning later in life, (URL 86).

- *Nursery School in Berriozar*

Designed by Javier Larraz, IñigoBeguiristain, and Iñaki Bergera in 2012 located in Spain. According to Louis I. Kahn" the first school began under a tree, when a man who knew he was a teacher began to discuss what he had learned with others who did not know they were students. Like children under 3 years old learn intuitively and unconsciously. Drawing a parallel with the story of Kahn, one might wonder about the role that tree, that is, architecture, plays in the practice of teaching". (URL 81).

- *Kensington International Kindergarten*

Designed by Plan Architect & Ketsiree Wongwan in 2012, located in Bangko, China. Free form of this project is mainly intend to find the new perception of playing space that should give more opportunity for the kids to use the space up to their imagination, (URL 87).

- *Loop kindergarten*

Designed by SAKO Architects in 2011- 2012 located in Tianjin, China. SAKO Architects used all the colors of the rainbow for the playgrounds, classrooms and roof garden of this doughnut-shaped kindergarten, (URL 88).

- *Pajariro Jardin Infantil La Aurora Kindergarte*

Designed by; Viviana Peña, Eliana Beltran, Catalina Patiño and Federico Mesa in 2011, located in Medellin, Colombia. The kindergarten is a gorgeous cellular building topped with a lush green roof garden. The innovative kindergarten was conceived with a landscape architect's eye - green spaces and horticulture are carefully incorporated within the building's design,(URL 89).

These ten examples of kindergarten had been analyzed in the following tables according to both criteria architectural and interior architectural.

3.3.1 Analysis Tables

Table 1: Criteria Analysis of Prototypical Kindergarten. Ex.1 (URL 82)

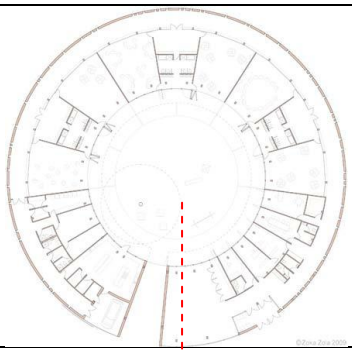
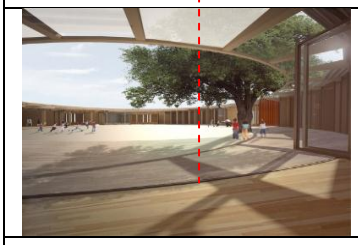
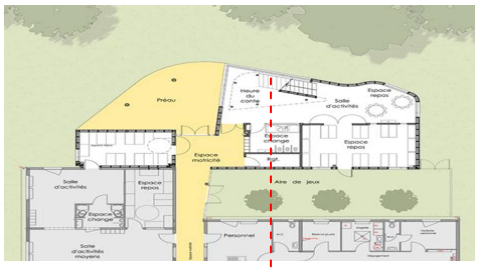
General Information														
														
Architectural evaluation criteria														
Courtyard														
														
Interior architectural criteria														
Colors			Materials			Windows								
														
Summary														
Architectural elements			Planes			Surfaces						Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture	Texture of wood	Materials	Wood material	Colors	Brown color	Art Element	Furniture	Large windows	Skylight

Table 2: Criteria Analysis of Le Petit Prince Nursery School. Ex.2 (URL 83)

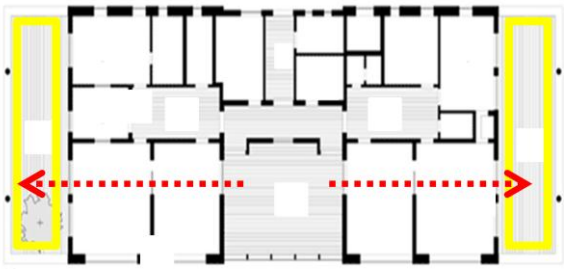
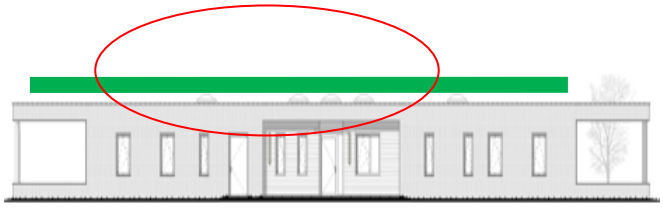
General Information	
	
Architectural evaluation criteria	
Terraces	Green roof
	
Interior architectural criteria	

Colors	Materials	Windows	Skylight
			

Summary

Architectural elements			Planes			Surfaces						Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture	Texture of wood	Materials	Wood material	Colors	White and brown	Art Element	Furniture	Large windows	Skylight
	■	■				■	■	■	■	■	■			■	■

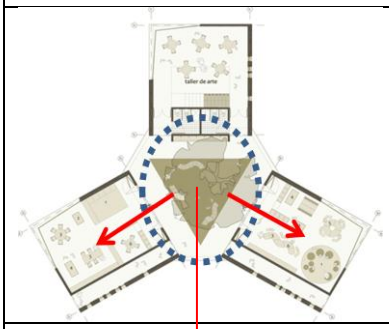
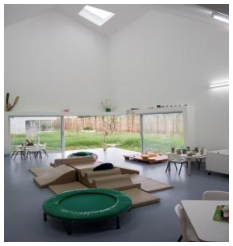
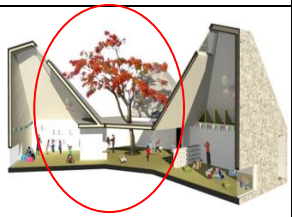
Table 3: Criteria Analysis of Forscher Kindergarten Apfelbäumchen. Ex.3 (URL 84)

General Information	
	
Architectural evaluation criteria	
Terraces	Green roof
	
Interior architectural criteria	
Materials Colors	Elements / Windows
 	 

Summary

Architectural elements			Planes			Surfaces					Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture	Texture of wood	Materials	Wood materials	Colors	Art Element	Furniture	Large windows	Skylight

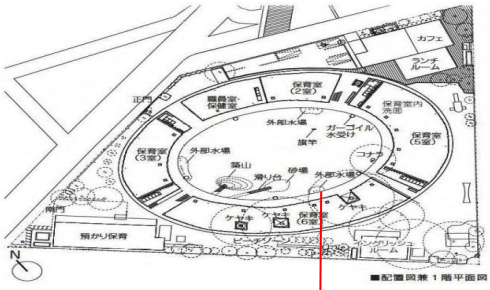
Table 4: Criteria Analysis of Timayui Kindergarten. Ex.4(URL 85)

General Information		
		
Architectural evaluation criteria		
Courtyard	Terraces	
		
Interior architectural criteria		
Colors	Elements	Windows	skylight
			

Summary

Architectural elements			Planes			Surfaces				Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture		Materials		Colors	White color	Art Element	Furniture	Large windows	Skylight

Table 5: Criteria Analysis of Fuji Kindergarten, Ex.5 (URL 60)

General Information	
	

Architectural evaluation criteria	
Courtyard	Terraces
	

Interior architectural criteria			
Colors	Elements	Widows	skylight
			

Summary

Architectural elements			Planes			Surfaces						Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture	Texture of wood	Materials	Wood material	Colors	White and brown	Art Element	Furniture	Large windows	Skylight

Table 6: Criteria Analysis of Sighartstein Kindergarten. Ex.6 (URL 86)

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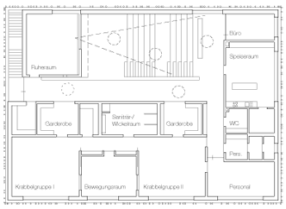
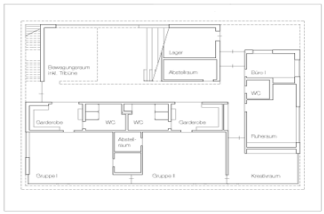
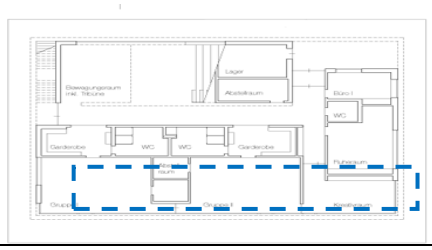
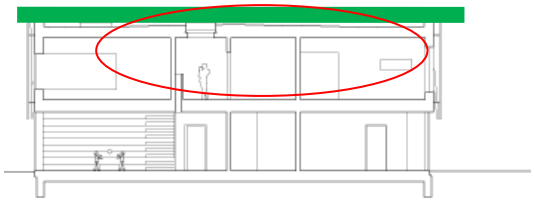
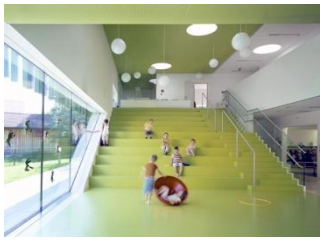
<tr><td colspan="3"> 
First floor</td><td colspan="3"> 
First floor</td><td colspan="5">  </td></tr>
<tr><td colspan="11">Architectural evaluation criteria</td></tr>
<tr><td colspan="5">Terraces</td><td colspan="6">Green roof</td></tr>
<tr><td colspan="5">  </td><td colspan="6">  </td></tr>
<tr><td colspan="11">Interior architectural criteria</td></tr>
<tr><td colspan="4">Colors</td><td colspan="3">Materials</td><td colspan="4">Windows</td></tr>
<tr><td colspan="4">  </td><td colspan="3">  </td><td colspan="4">  </td></tr>
<tr><td colspan="11">Summary</td></tr>
<tr><td colspan="3">Architectural elements</td><td colspan="3">Planes</td><td colspan="4">Surfaces</td><td colspan="2">Objects</td><td colspan="2">Light</td></tr>
<tr><td>Courtyard</td><td>Terraces</td><td>Green roof</td><td>Vertical garden</td><td>Elevated garden</td><td>Interior garden</td><td>Texture</td><td>Materials</td><td>Colors</td><td>Green colors</td><td>Art Element</td><td>Furniture</td><td>Large windows</td><td>Skylight</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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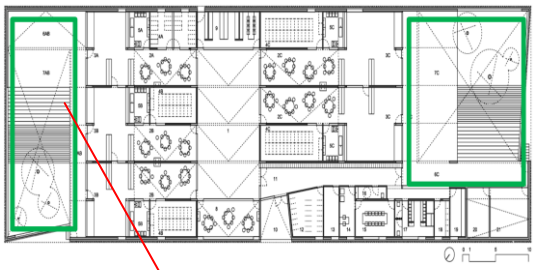
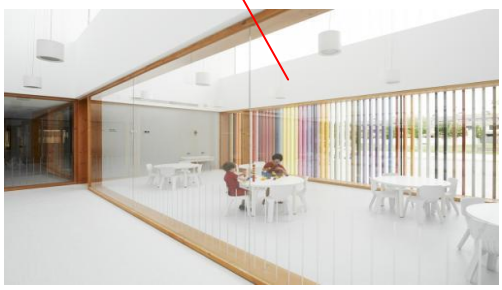
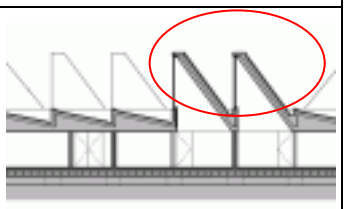
Table 7: Criteria Analysis of Nursery School in Berriozar Kindergarten. Ex.7 (URL 81)

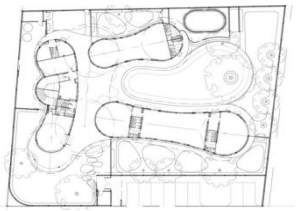
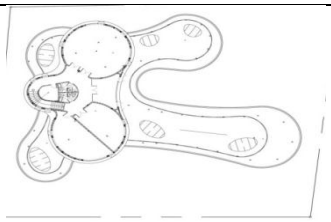
General Information	
	
Architectural evaluation criteria	
Courtyard	Terraces
	
Interior architectural criteria	
Colors	Windows
	

Skylight


Summary

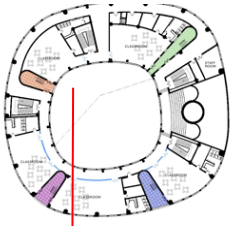
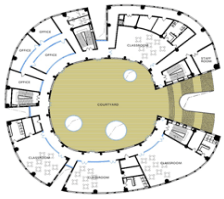
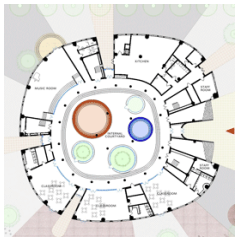
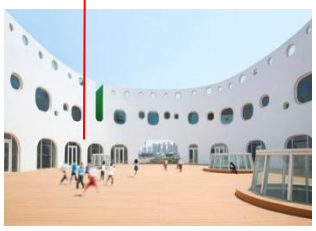
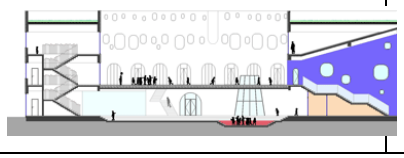
Architectural elements			Planes			Surfaces					Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture		Materials		Colors White color	Art Element	Furniture	Large windows	Skylight
■	■									■			■	■

Table 8: Criteria Analysis of Kensington International Kindergarten. Ex.8 (URL 87)

General Information		
 Ground floor	 First floor	
Architectural evaluation criteria		
Courtyard	Terraces	Green roof
		
Interior architectural criteria		
Colors	Materials	Elements	Windows
			

Summary														
Architectural elements			Planes			Surfaces						Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture	Texture of wood	Materials	Wood material	Colors	White and brown	Art Element	Furniture	Large windows	Skylight

Table 9: Criteria Analysis of Loop Kindergarten. Ex.9 (URL 88)

General Information			
			
Architectural evaluation criteria			
Courtyard	**Terraces**	**Green roof**	
			
Interior architectural criteria			
Colors	**Materials**	**Windows**	
			

Summary

Architectural elements			Planes			Surfaces					Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture		Materials		Colors	Art Element	Furniture	Large windows	Skylight
■	■	■			■					■			■	

Table 10: Criteria Analysis of Pajariro Jardin Infantil La Aurora Kindergarten, Ex.10 (URL 89)

General Information		
		
Architectural evaluation criteria		
Courtyard	Terraces	Green roof
		
Interior architectural criteria		
Colors	Windows	
		

Summary

Architectural elements			Planes			Surfaces					Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture		Materials		Colors	White color	Art Element	Furniture	Large windows	Skylight

3.3.2 Summary of the Tables and Comments of the Research

In the summary of these analysis examples regarding to the architecture and interior criteria, it's obvious that there are many features of nature can integrated with the interior design. Through courtyards/ backyards, terraces, green roof, as an architectural criteria. Also the usage of natural materials, colors, as well as getting natural lighting from big windows and skylight as interior criteria.

Table 11: Analysis Criteria results of the Ten Kindergarten

Analysis criteria			Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7	Ex. 8	Ex. 9	Ex. 10
Architecture evaluation criteria		Courtyard	■		■	■	■		■	■	■	■
		Terraces		■	■	■	■	■	■	■	■	■
		Green Roof		■	■			■		■	■	■
Interior architecture criteria	planes	Vertical Garden										
		Elevated Garden										
		Interior Garden			■						■	
	Surfaces	Texture	■	■	■		■			■		
		Materials	■	■	■		■			■		
		Colors	■	■	■	■	■	■	■	■	■	■
	Objects	Art Elements				■	■			■		
		Furniture										
	Natural light	Large Windows	■	■	■	■	■	■	■	■	■	■
		Skylight		■		■	■		■			

As shown in the table (12), it is clear that from these ten kindergartens 4 of them have the most connection to the nature from the other five kindergartens, through architectural and interior architectural criteria; such as courtyards, terraces, green roofs, natural materials (wood, stone), natural light, and colors (white, green, blue, brown); while all these examples has no vertical, and elevated gardens.

Chapter 4

THE “LEVENT KINDERGARTEN” AS A REAL-LIFE TEST CASE

Everything done until now was to reach this point where self-formulated analysis criteria can be applied to a real-life test case. There is one main school that could be used as a case study: the Levent Kindergarten in Nicosia designed by the architect Dr. Fevzi Özersay . There is also another kindergarten: English School of Kyrenia designed by the architect Megaron, which is under constructions and designed as a nature-friendly school that could have been the subject of this research but it is yet to be finished. All the plans for such a school design is on paper for now. Thus, the latter candidate, Levent Kindergarten was chosen. However in the appendix part the once who are further interested can find more information, which summarized the conceptual approach of this project in relevance to the topic of this thesis. this chapter is divided into three sections: the first section will provide historical background of Levent Kindergarten; the second section will provide the method of analysis of Levent Kindergarten by looking at the perspectives of both the architect and the teachers; and the last section will discuss the analysis of the interior space based on the evaluation criteria that mentioned in Chapter 3.

4.1 Levent Kindergarten

Levent Kindergarten in Nicosia started at the 2011-2012 Academic Year with 252 students in its new building. There are 28 class teachers, four subject teachers; and there is a principal and a vice-principal in the school that is serving children between the ages of 3 and 5. The school provides a full-day service and prepares separate programs for each age group. The meals served in the 350 people capacity lunch hall are prepared under the supervision of a dietician. There is a lawn indoor playground, closed playground, activity rooms for subject like art, music, and physical education as well as a separate terrace and garden for each classroom. The education is in both English and Turkish. The program is supported by many different activities. The school also easies the preparation process of children for primary school. The school also organizes observation and educational trips in order to reinforce children's knowledge in art activities like cinema, theatre, exhibition, etc. Levent Kindergarten also aims to make a difference at pre-school education by parent-involved projects and portfolios. Currently, there are 40 teachers including the principal; the capacity has been increased up to 17 by the extra-built classrooms and there are approximately 22 students in each classroom, (URL 90).

4.1.1 Method of Analysis of Levent Kindergarten

There are many methods that were used in this study, starting with the observation on the site, conversations, taking photos, collecting Auto CAD drawings of the architecture design of Levent Kindergarten, that needed for analysis in detail every part of this building, which related to the nature by making tables of analysis for the main criteria mentioned in the chapter three and used also before in the analysis of the ten

contemporary approaches of kindergarten. According to the criteria which was taken from the literature review and terminologies based on (books, articles, websites, etc), in addition to that interview with the architect of the Levent kindergarten and questionnaire for teachers. By all these means the analysis had been done via tables.

4.1.2 Perspective of the Architect

Interview has been done as another method supporting this research which conducted with the architect of the Levent kindergarten Dr. Fevzi Özersay the director of the architectural office, Atelier-M (Architecture, Engineering and Consultancy) in Nicosia. The architect tried to focus on two main things that are very important rather than just greenery: natural light, how could get light into the interior spaces, and natural air, sun orientation especially for day units. The restrictions was the shape of the site that was elongated and narrow, and the approach of his client was already had a finished project in their hands; a long corridor with classical classrooms on both sides. They were not satisfied about design and they asked for another proposal. While the potential of the site; that the day-units at the same level of the garden, at the south facade with windows facing south and with plenty of light. The architect tried to move beyond the classical "blackboard and in front of it sitting kids" image. He was influenced by "creating spaces for play". Learning through play was at the centre of everything according to what Montessori meant. Create open, semi open, semi closed and closed spaces for play to provide children spaces, where they could have all the time their windows/sliding doors open and be in direct relationship with their private gardens in front of each day-units.

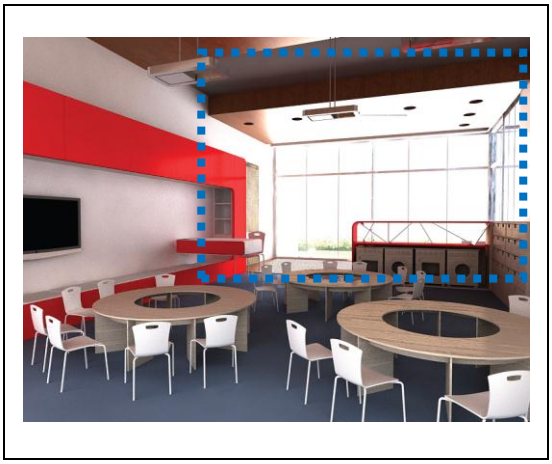


Figure 44: View of the Garden through Big Windows

As well as the concept of the elevated gardens between two day-units/classrooms they were also visually visible from the interior of the classrooms in order to provide a strong indoor-outdoor connection.

Figure 45: The Elevated Garden in the Terraces

The architect was influenced by the Fuji kindergarten which had been analyzed with the ten examples of kindergarten in chapter 3, table (5); he tried to achieve similar design in the inner courtyard of Levent. At some places he tried to add level higher than the ground, big adding slides to these spaces at the second floor as focal points. However, unfortunately due to economic reasons these were not realized.

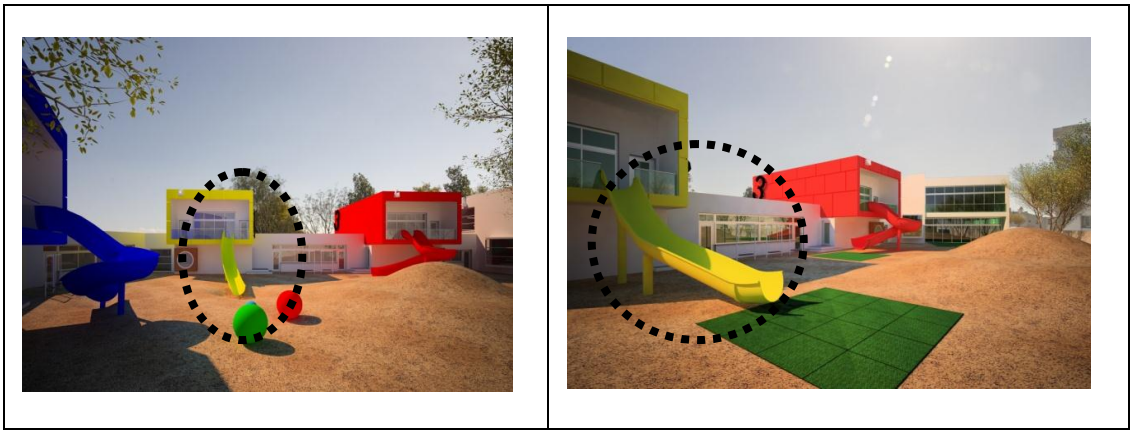


Figure 46: The Courtyard with the Slides Connecting the two Levels

The semi opens terraces which provided enough sun-control. There are ‘cuts’ into this garden wall because there is concerned with the ventilation, because the classrooms were close to the road. Also another concept was to make a common play area in the entrance have direct with an access to the common playground. They divided this playroom into two extra classrooms; also proposal detailed landscape design for the main courtyard was never put into life. In the design scheme they used natural cladding such as wood and yellow stone; as he stated "we choose an almost non-colored scheme: Whitewash with three basic colors just at three second floor masses". While the colors that were used in interiors advised by the teachers were preferred very soft, pastel colors, tranquil, and natural.

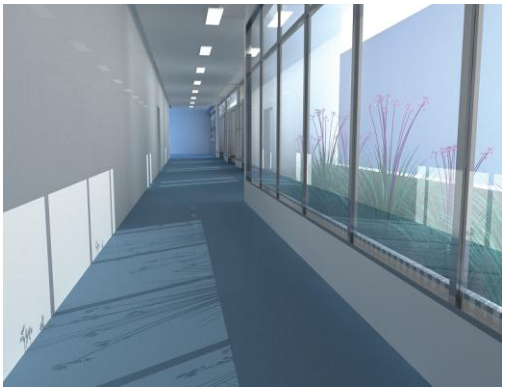
	
a) Three colors at three second floor masses	b) Long corridor overlook to the courtyard

Figure 47: Colors and the Corridors

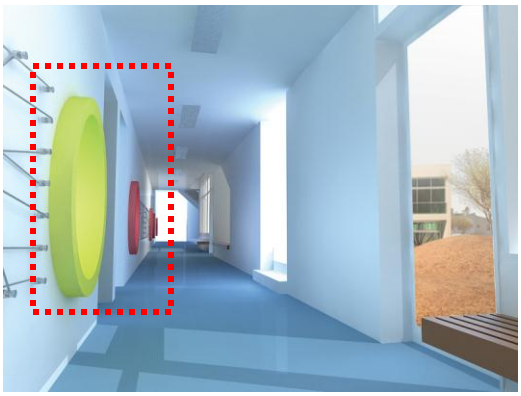
According to the design scenario there was a story-tree in the entrance children could sit under this tree and listen to fairy tales, as in the 3D renders show.

Figure 48: Story-Tree in the Entrance

The designer was commented on the eating room which looks very big and not domestic. The problem was to design a building for 300 kids, while the standards put limits, the maximum number of children in a kindergarten should be 120. It would be too much noise, too many classrooms opened to too long corridors. He tried to overcome this acoustical problem through the suspended ceiling materials. He could not do

anything just informed his client. Another treatment was design openings at their eye level help them to watch the greenery in the courtyard.



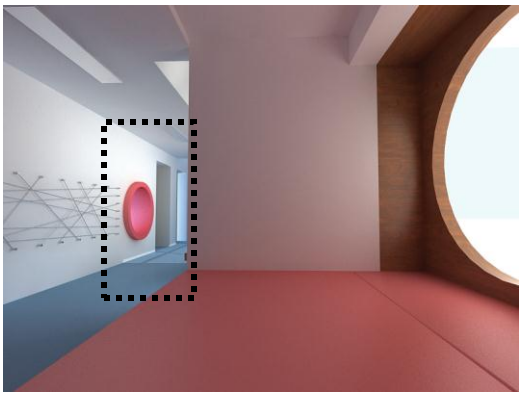


Figure 49: Colored Openings Connecting the View to the Courtyard

The whole site had a serious rainwater problem he tried to solve it by the elevated gardens between two classrooms. So the rainwater, coming from the roof and following the chains hanging from the gargoyles, runs down into the elevated gardens.

Elevated gardens between two classrooms

Figure 50: Elevated Gardens and the Chains Hanging from the Gargoyles

Finally, the architect of Levent Kindergarten personally would more prefer a more designedly, more contemporary/creative approach to interior landscaping. And the interior scaping could be possible in Levent Kindergarten if there are no economical constraints; (the detail of the whole interview is in the appendix 2).

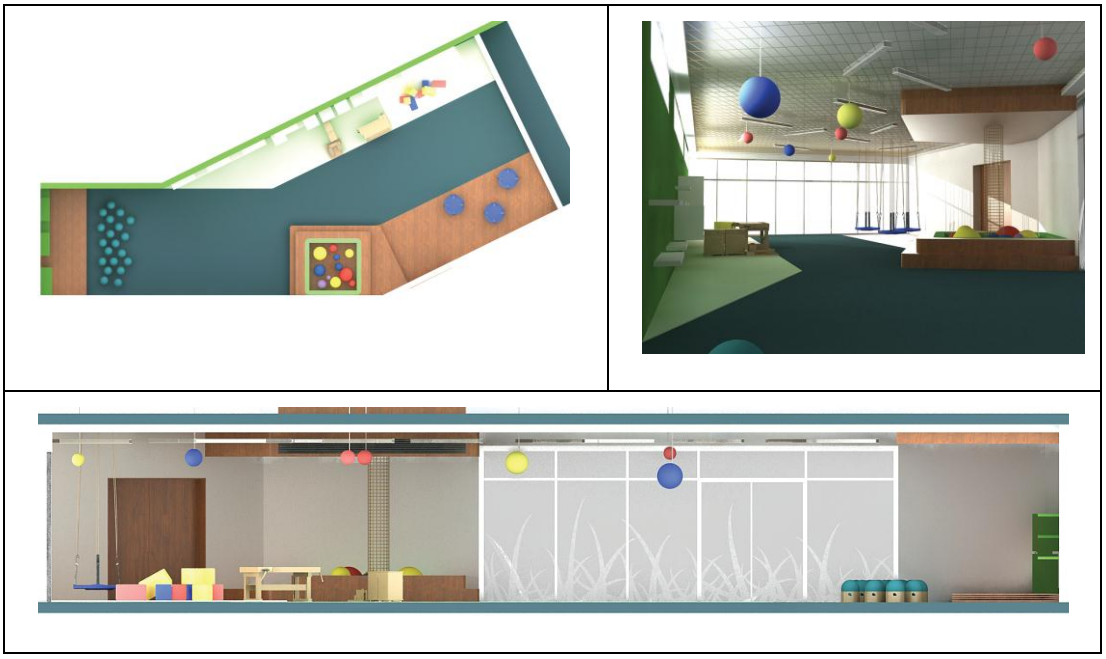
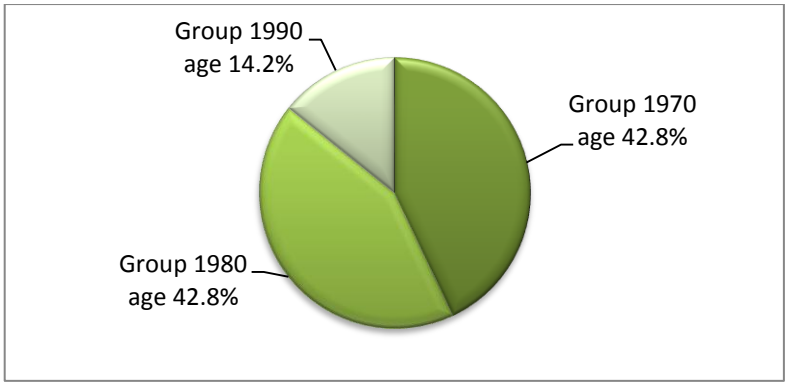


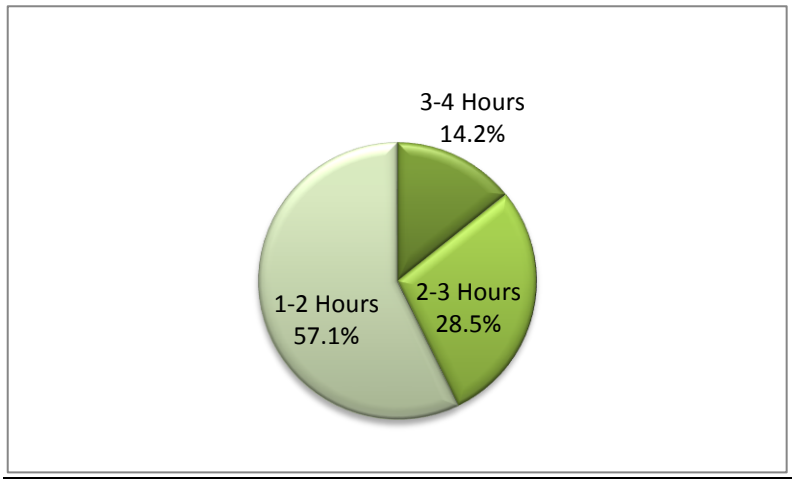
Figure 51: Design Detail of the Day Units with Big Windows and Sliding Doors

4.1.3 Perspectives of the Teachers

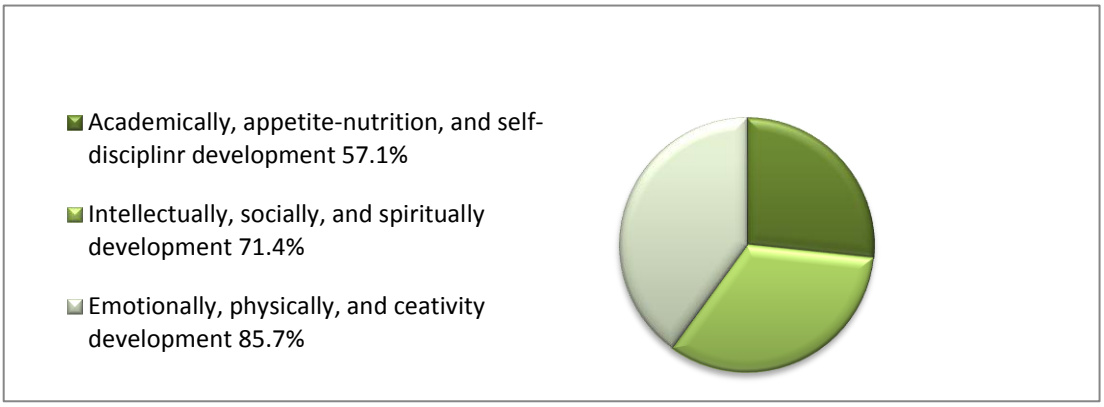
In addition to the interview with the architect a questionnaire was given to the teachers of Levent Kindergarten, can be found in appendix (3). It was hoped that this questionnaire will help them to express their opinion about the significance of interaction with nature as a positive effect on children as well as teaches in the kindergarten. The questionnaire was done for 20 teacher's just seven out of ten English speaking teachers they gave their responses. Here is the result of their responses:



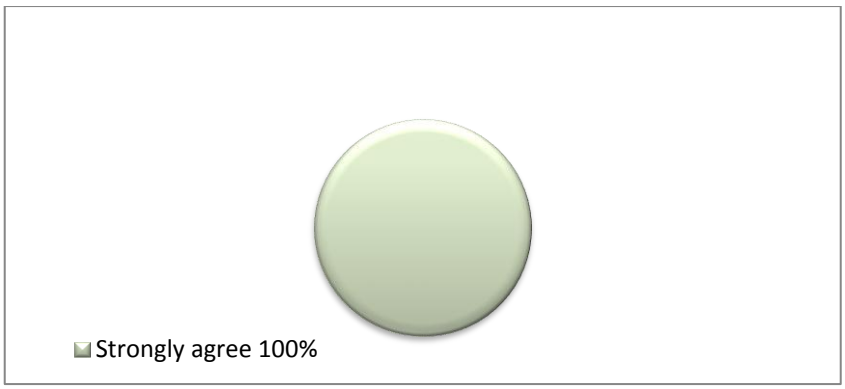
Graph 2. Age group of teachers



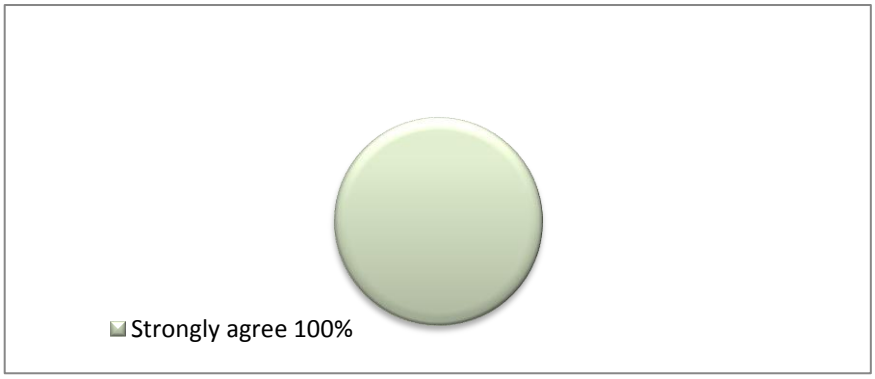
Graph 3. The hours that child needs each day to be in contact with nature



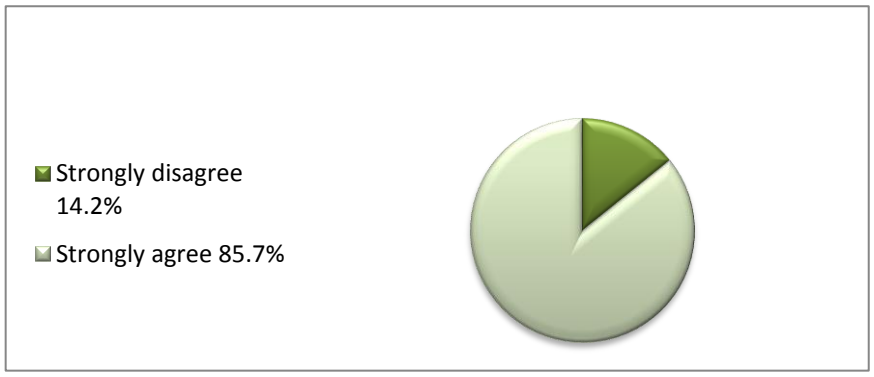
Graph 4.Children's development



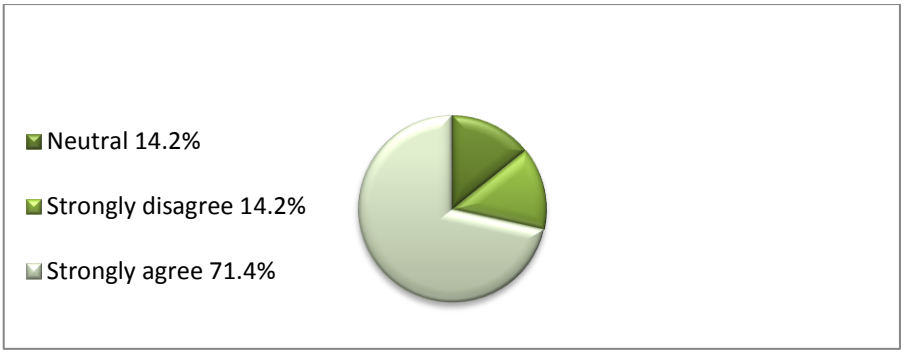
Graph 5.The increasing amount of parents who are worried about their children spending more than seven hours each day in front of electronic media



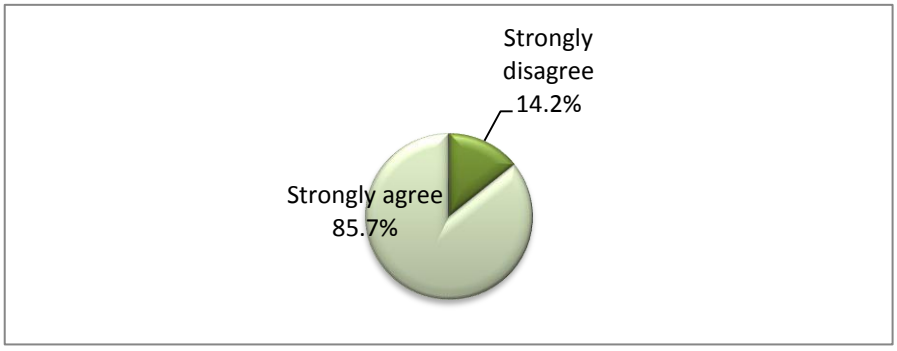
Graph 6.The parents who worried about their children growing up without any close contact with nature



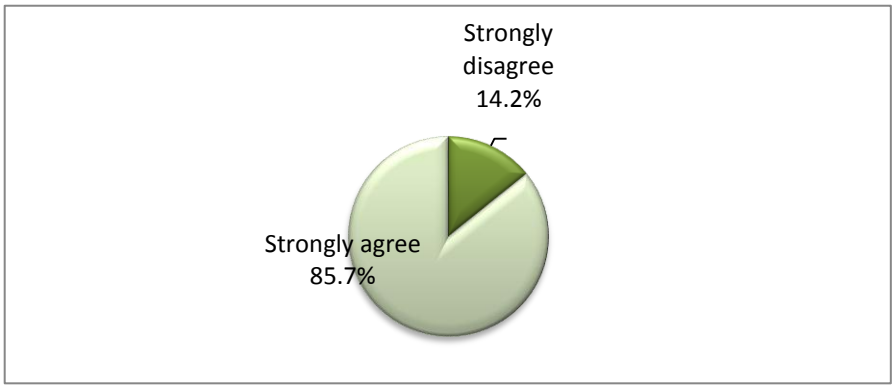
Graph 7.Nature has positive effects on the psychology of children



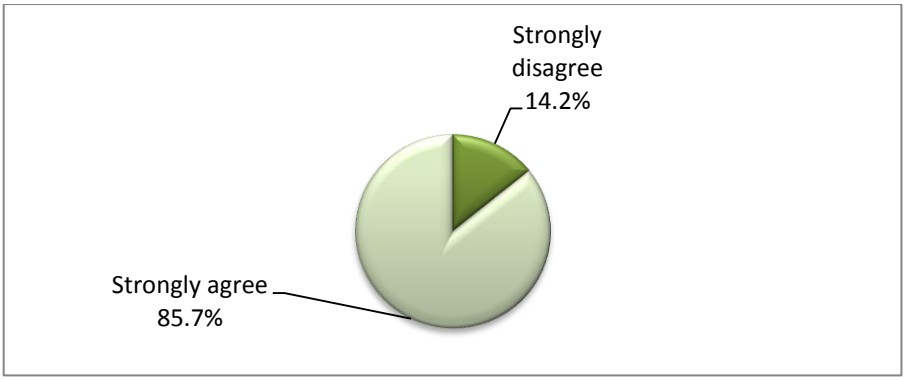
Graph 8.The broad area of glazing in Levent classrooms, allows more contact with nature and direct access to the private gardens



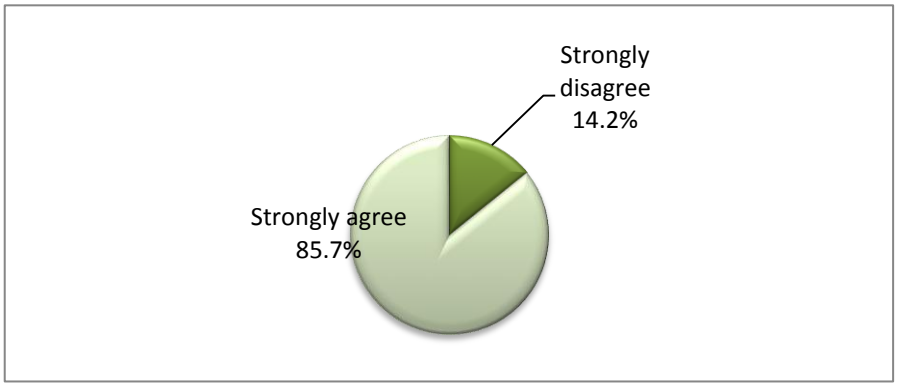
Graph 9.Semi- open terraces in Levent Kindergarten are important for children to maintain their contact with nature even when the weather is bad



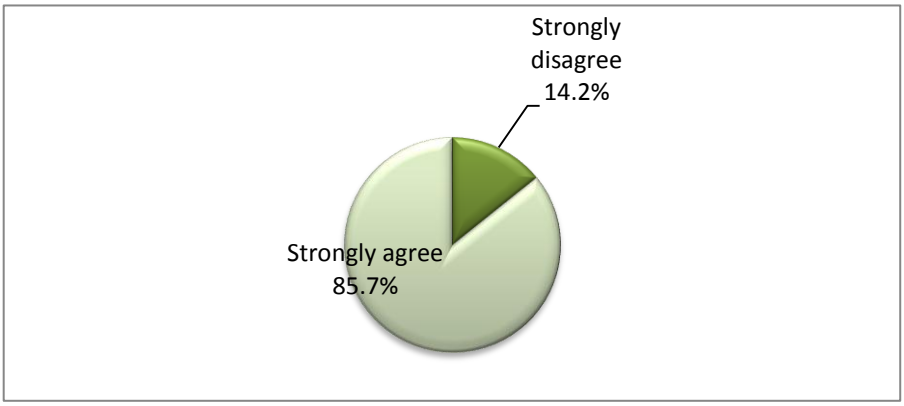
Graph 10.The day lighting, which is important for children's health is successfully designed in this nursery



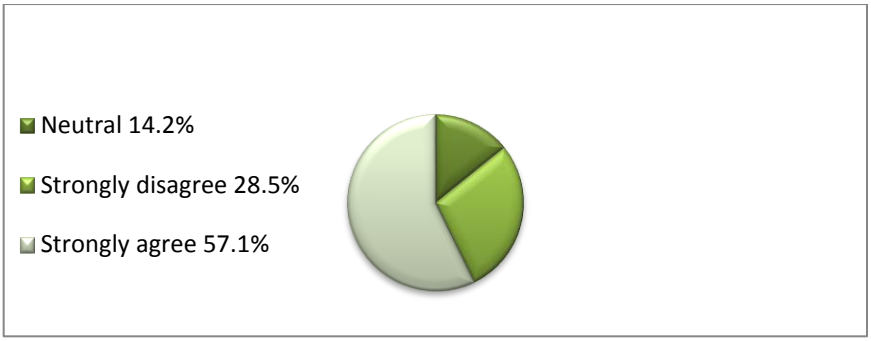
Graph 11. The preferred indoor colors are good for children



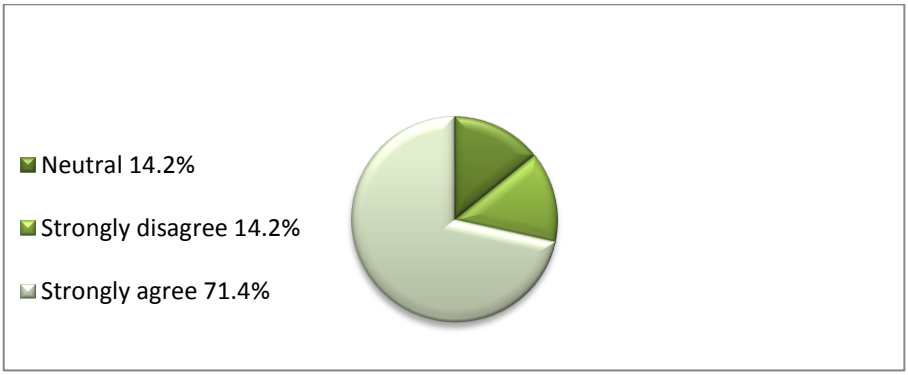
Graph 12.If well planned in advance, using plant art or vegetation in Levent interiors could be possible and beneficial for children



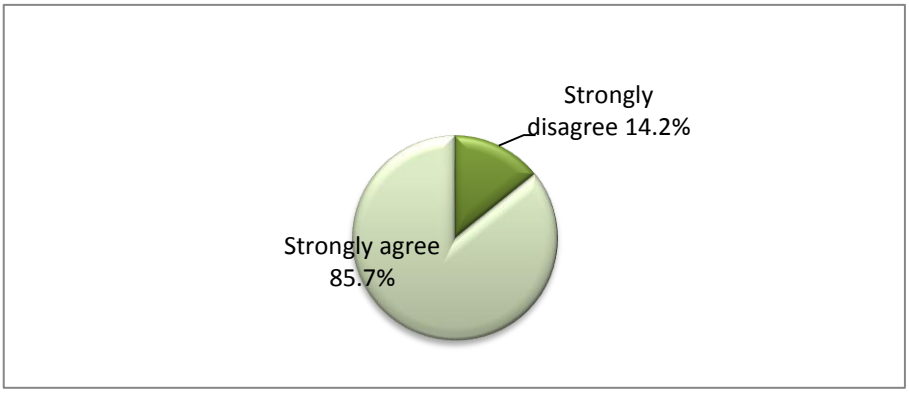
Graph 13.The presence of plants in the kindergarten interiors could be good for purifying (clearing) the air and maintaining health



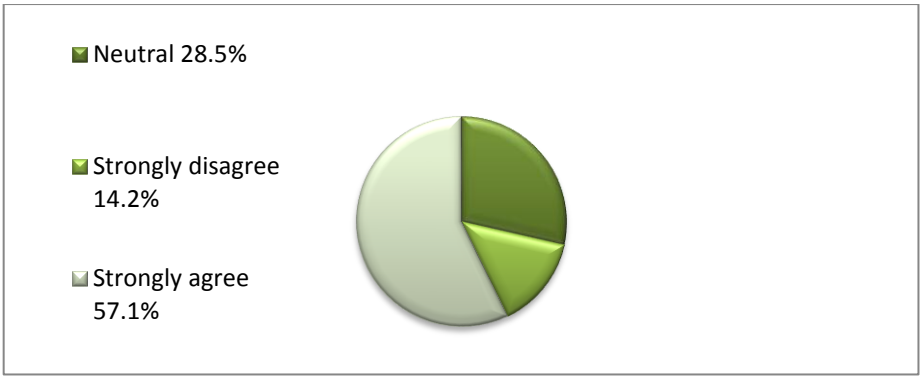
Graph 14.According to the current educational programme of Levent, the time (1-2 hours) the children are spending outside is sufficient



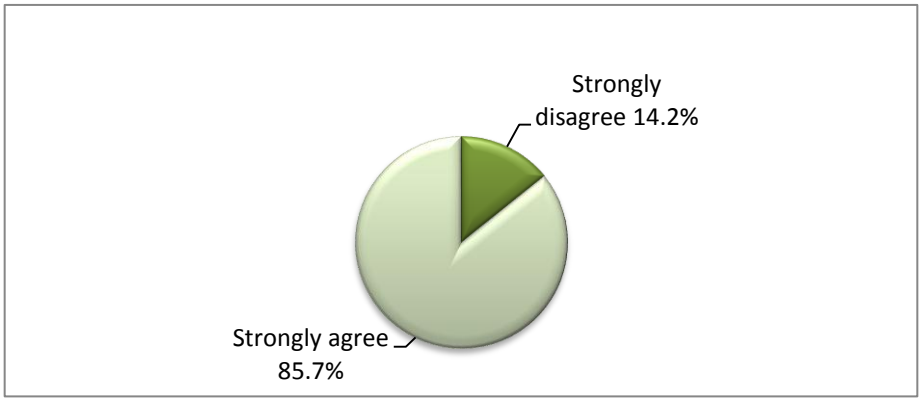
Graph 15.The elevated (1m high) little gardens, which are situated in between two Levent classrooms add extra value to indoor-outdoor interaction and give a positive feeling for the indoor users



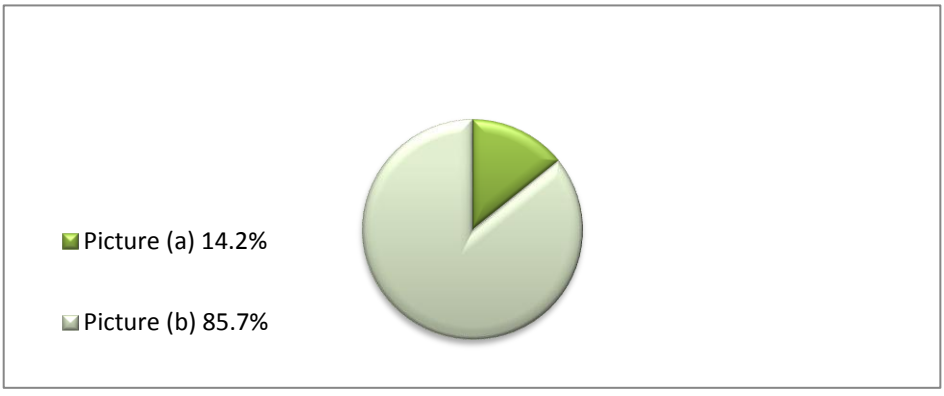
Graph 16.As a teacher, when I consider the nature-interior space relationship provided in our school interiors, I feel lucky to be working here



Graph 17.The children are very efficiently using the private gardens in front of the day-units



Graph 18.The main courtyard of the school could be improved by improving landscaping and adding attractive natural play opportunities for children such as sandpits, fountains, trees etc...



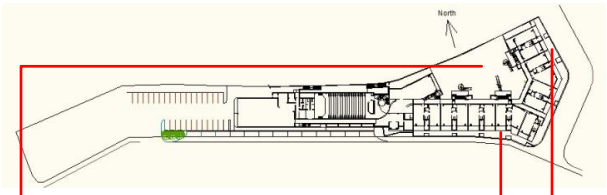
Graph 19.The most appropriate Picture for the entrance hall

More information about the sample of questionnaire can be found in appendix 3.

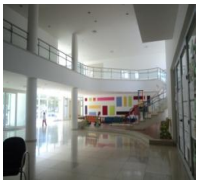
4.1.4 Tables of Analysis of the Interior Spaces According to the Criteria Described in Chapter 3

After the definition of the terminology, the analysis criterion was also based on the determined terminology. The concepts of planes, surfaces, objects/elements, and light form the tool for analysis of this research. This study uses a criteria made of the defined terminology to evaluate the intersection of nature with these components in all the examples as well as the Levent Kindergarten. The same analysis criterion that was tested on the analyses of the ten kindergarten examples from different countries have been also used to evaluate Levent kindergarten. In other word, the criterion was tested twice: first on paper for ten kindergarten examples and secondly on a real-life case study Levent kindergarten as well as English school in Kyrenia.

Table 12: Analysis Criteria of Levent Kindergarten in Nicosia

General Information	
	 Ground floor

Architectural Evaluation Criteria	
Courtyard / backyards	Terraces
	

Interior architecture criteria				
Colors	Materials	Elements	windows	Elevated garden
				

Summary of Results

Architectural criteria			Planes			Surfaces						Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture	Texture of wood & stone	Materials	Wood and stone	Colors	White color	Art Element	Furniture	Large windows	Skylight
■	■			■		■		■		■		■		■	

Table 13: Analysis Criteria of Interior Elements (Entrance Hall)

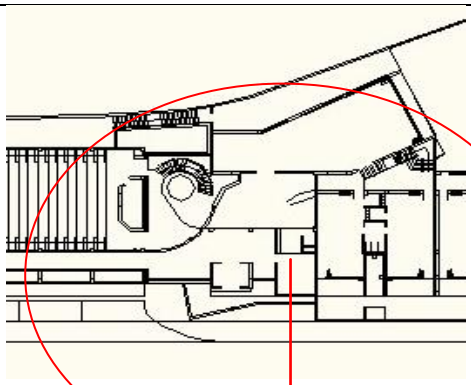
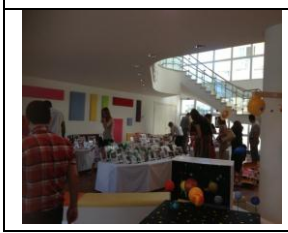
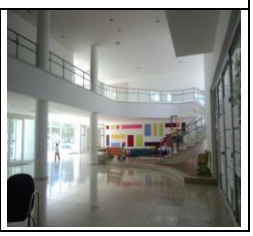
Interior architecture criteria for Entrance hall			
			
Colors	Materials	Elements	Windows
			

Table 14: Analysis Criteria of Interior Elements (Day Units)

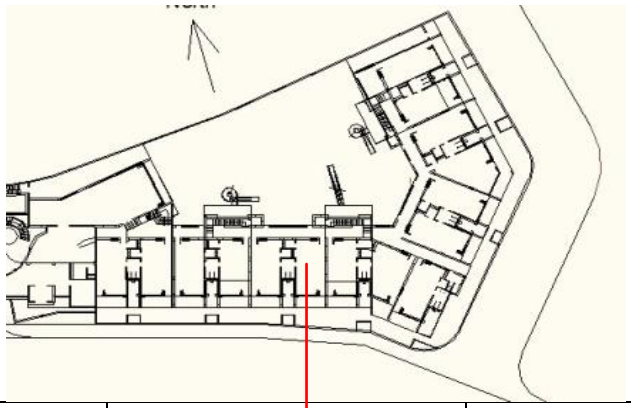
Interior architecture criteria day units		
		
Colors	Materials	Windows
		

Table 15: Analysis Criteria of Interior Elements (Eating Hall)

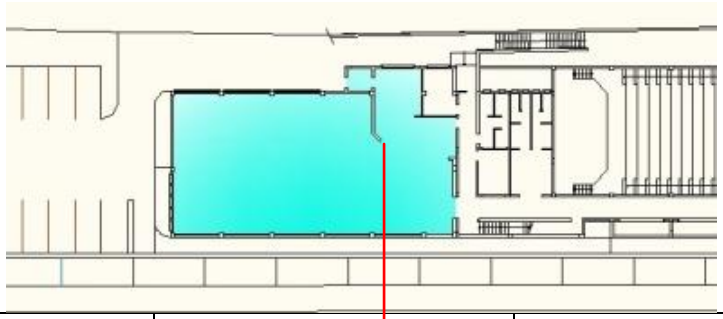
Interior architecture criteria for Eating hall		
		
Colors	Materials	Large windows
		

Table 16: Analysis Criteria of Interior Elements (Corridor 1)

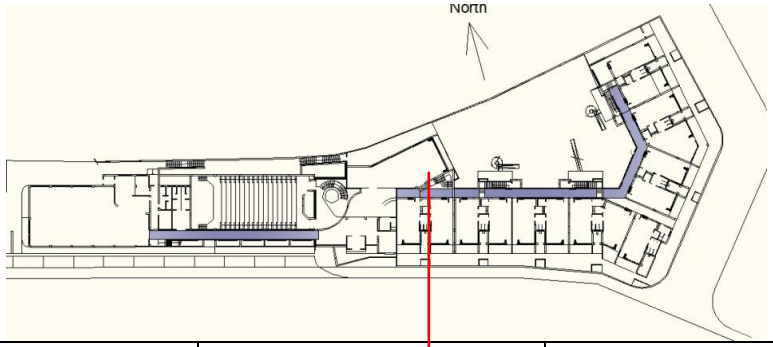
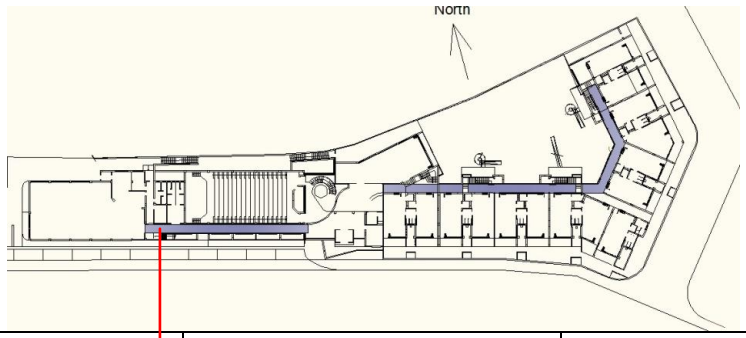
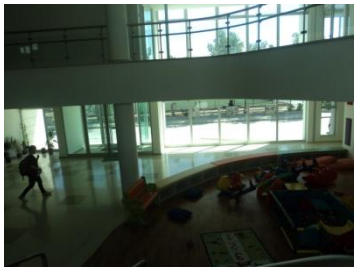
Interior architecture criteria for Corridor (1) leading to the eating hall		
		
Colors	Materials	Windows
		

Table 17: Analysis Criteria of Interior Elements (Corridor 2)

Interior architecture criteria for Corridor (2) connecting the day units		
		
Colors	Materials	Large windows
		

4.1.5 Summary of the results

The tables of analysis of the real life -case Levent Kindergarten had been shown that the design has included big courtyard with no landscape, terraces for each day units giving natural ventilation and natural light, which considered as an architectural criteria. As well as, the interior architectural criteria such as; elevated garden between each two day units, also the natural light through big windows. In addition to that using natural materials like wood and yellow stone, some plant pots located in the entrance hall. At the end of this summary, I think there is good relationship between the interior design and nature through all these criteria which had been explained previous by tables.

Chapter 5

CONCLUSIONS

Contact with nature has positive effects on human in general, and specifically on children, who are spending more time in indoor spaces. Because of the benefits of connecting to nature (psychological, physical health, social, spiritual, and academic), it should be more considered about integrate nature into the interior design in all aspects including natural light and ventilation, natural materials, and indoor plants. This research tried to explore the role of nature as a significant tool in interior spaces, specifically in kindergartens and explain many terminologies related to nature in interior design such as architectural elements and interior elements, through different practices of architecture buildings, architects, designers, and products. By evaluating many kindergarten cases from different countries, and carrying out a case study at Levent kindergarten as a real-life example; the role of nature as a significanct tool in interior was discussed.

The findings of this research had been shown through discuss these terminologies and literature review which included in interior architecture practice such as many exemplary buildings interiors. There are many interior elements, which could bring nature to indoor spaces, such as vertical garden, elevated garden, interior garden, indoor plants, wall art, plant pots and ponds. These have all been considered as interior architectural criteria which were also used to evaluate the ten examples of contemporary

kindergarten from different locations from the world, and the Levent kindergarten as a real-life example. Based upon the book of Brooker & Stone these interior criteria wrer categorized into four elements; and these are: Planes, Surfaces which include (materials, texture, and colors), Objects (elements, furniture), and finally Natural light. Besid the architecture elements which derived from many examples of contemporary kindergarten architecture interiors provided the architectural criteria such as: Courtyard, terraces, and green roof. Each of these criteria which related to the nature gives positive impact to the health and psychology. For example the courtyard could bring natural light and air to the interior space through using big windows, sometimes they use skylight to get the natural light to the interior space. Terraces could give view to the nature through big windows and interior plants. The windows are the essential parts of the buildings at which individuals spend part of their days. It is usually preferred to live in structures fitted with windows that allow them to view the surroundings, because of the impact of viewing nature through windows has positive effects on mental health more extensively too. The green roof which serves several purposes such as absorbing rainwater, providing insulation, helping to lower air temperatures and mitigating the heat effect is also a very frequently used elements. The usage of natural materials, incorporating color schemes which are in harmony with nature also were found as strong help in creating comfortable and psychologically nurturing environments. Natural light is the most important factor for human health. It is also easy to whish can get trough big windows and/ or skylights. Ntural air which is also very important for health can also achieved through big windows and natural ventilation. Room plants are also very helpful in windy and cold weathers when windows cannot be opened but they are more difficult to take care of since they need more maintenance.

According to these entire elements both architectural and interior, the nature can be brought indoor when the architect and interior design consider the importance of these criteria to be integrated nature in their design. All these elements could be serving the economic factor to save the energy, because it doesn't need to manufacture. Therefore, great attention should be considered to nature when design the interiors of the kindergarten.

Finally, as an end note it can be stated that the green roof is a distinctive element that was observed in the project of the English school of Kyrenia. Where as, it was not present in Levent Kindergarten.

Recomondations

- The concept of courtyard or terraces could provide natural light and natural ventilation, with views to the nature such as landscape through spaces that has large windows;
- The concept of green roof can provide greater thermal performance and roof insulation for the buildings;
- Using indoor plants that can help to clean the indoor air, even though these plants need more maintenance;
- The concept of vertical garden, elevated garden, interior garden, indoor plants, which deals with planes are strong elements to help interaction with nature;
- Using natural materials such as stone and wood can bring harmony with nature, also texture and colors can help a sense of nature to the interior spaces.

- Many creatively designed objects such as plant pots, wall art,….., can be an integral part of interior spaces dialogue with nature .

It is hoped that this research will be helpful to the ones who are interested in similar areas of research, and besides to young interior designers, students, and interior landscape designers at least as an inspiration.

As a concluding remark, it would not be wrong to state that of course, no doubt, everybody agrees, nature inside – brilliant for million reasons. However, some main issues still remain unanswered. There are still a couple of issues that create confusion: How to do interior landscaping? How is it possible, in terms of funding? Is it possible to do it without knowing how? Research analysis results of kindergarten examples evaluated in this study shows that the easiest way to do interior landscaping is through 'vistas' and 'light'; and the most difficult part is to bring in 'water'; the element that is dealt the least is 'noise' which is also invisible in the analysis. Yet, despite all the challenges and confusion effective interior landscaping is not impossible rather it is difficult to achieve.

As other potential areas of research for future, two suggestions for further can be mentioned. One is a study on the curricula of interior design schools in order to evaluate if this topic is an integral part of the education of interior designers. And the other one is a case study on more examples of kindergartens or other public areas in Iraq, e.g. the city of Erbil. Another recommendation for further study could also be a study on developing a theory of interior landscaping principles.

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APPENDIX OR APPENDICES

Appendix 1

List of all Kindergartens

No.	Name of Kindergarten	Architect	Date	Location
1	Free Play Kindergarten	G.O.Y.A. (group of young architects)	2010	Austria
2	Four- Leaf clover kindergarten	OFIS architects		Slovenia
3	Minimart Kindergarten	Slovenia	2009-2010	Slovenia
4	Kindergarten Kekec	Arhitektura Jure Kotnik	2009-2010	Slovenia
5	Kindergarten Neufeld an der Leitha	SOLID architecture ZT GmbH	2010	Austria
6	Fagerborg Kindergarten	Reiulf Ramstad Architect	2010	Oslo
7	Segrt Hlapic Kindergarten	Radionica Arhitekture	2008	Croatia
8	Els Colors Kindergarten	RCR Arquitectes	2002	Spain
9	Cordoba Kindergarten	Radionica archtects	2010	Spain
10	Mavrica Breda Kindergarten	Bizjak, Dragišić, Florjanc, Jelkić, Saje	2011	Slovenia
11	El Porvenir Kindergarten	Giancarlo Mazzanti	2010	Colombia
12	Loop kindergarten	SAKO Architects	2011-2012	China
13	SuZhou 133: BaiTang One Kindergarten Project	CPG Advisory	2012	China
14	Consell Kindergarten	RIPOLLTIZON	2010	Spain
15	Kindergarten 8Units	local architectural firm Losdel Desierto		Spain
16	El Caracol Kindergarten	Demos Arquitectos		Colombia
17	Kindergarten competition proposal	ARHIS architects		latvia
18	Kindergarten in wood construction	Syntax Architecture	2010	Austria

19	Prototypical Kindergarten	Zoka Zola	2009	Croatia
20	Concept Sticks kindergarten	Djuric Tardio	2012	Paris
21	Le petit prince nursery school	Carlos Barba	2011	France
22	Forscherkindergarten Apfelbäumchen	WINKENS architekten	2011	Germany
23	Timayui Kindergarten preschool	El Equipo de Mazzanti	2011	Santa Marta
24	Fuji Kindergarten	Takaharu and YuiTezuka	2007	Japan
25	Sighartstein Kindergarten	Kadawittfeldarchitektur's	2008-2009	Austria
26	Nursery School in Berriozar	Javier Larraz, Inigo Beguiristain, Iñaki Bergera	2012	Spain
27	Kensington International Kindergarten	Plan Architect& Ketsiree Wongwan	2012	China
28	Pajariro Jardin Infantil La Aurora Kindergarten	Viviana Peña, Eliana Beltran, Catalina Patiño and Federico Mesa	2011	Colombia

Appendix 2

4th June 2013 – Nicosia Interview with the architect of the Levent Kindergarten – Dr. Fevzi Özersay, the director of the architectural office, Atelier-M (Architecture, Engineering and Consultancy) in Nicosia.

Introduction:I would like to make an interview with you, regarding my master thesis, which is related to “nature-interior design” relationship and where the main focus is on “kindergarten architecture/interiors”. You can trust that this interview will be used only for the research purposes of my study and will not be shared anywhere else without your personal consent.

Q1. Can you please tell: At the beginning, was nature in one way or another a part of your conceptual approach to the design of the Levent Kindergarten?

Well, you cannot think of nature just as “greenery”. For us, what were important as “nature” were light, natural air ventilation and the sun orientation of the day-units. So, to mention in summary two main things were for us very important at the beginning. These were, as I have mentioned before first the “natural” conditions – and in specific natural light and air and secondly the shape and conditions of the site. The site of the kindergarten was a very specific one – elongated, narrow site, which was originally consisting of ten standard villa parcels. Just like the shape of a train. Fortunately it allowed us to situate the day units in a healthy way, at almost an ideal orientation which was South and East.

Q2. Could you please mention a bit about the approach of your client?

When our client addressed us, for the design of a kindergarten, they already had a finished project in their hands. This was a very classical school-like project, where there was a long corridor with classical classrooms on both sides. They were not at all happy with this project. And that is why; they decided to ask for a design proposal from us. For us, it was important to understand their point of view. So, we were not after a classical nursery, with a mainstream educational space, with a blackboard and students sitting in fixed locations. And at the same time we were sure: We were after light! We were a lot concerned about how we could get into the interior spaces as much light as possible. It was only then, that we noticed the potential of the site; that we could have day-units at the same level of the garden, and simultaneously situated at the south facade with windows facing south and with plenty of light.

Q3. How did this match with the needs of a kindergarten?

Yes, it was at this point that we looked deeper into the concept of kindergarten spaces. We tried to move beyond the classical “blackboard and in front of it sitting kids” image. We learnt what Montessori meant. It was all about “creating spaces for play”. Learning through play was at the centre of everything. So our mission was clear: To create open, semi open, semi closed and closed spaces for play. In this hierarchical order... And off course we had the climatic factors. We felt it would really be nice luxury to provide children to provide spaces, where they could have all the time their windows/sliding doors open and be in direct relationship with their private gardens, which could be in front of each day-unit.

Q4. How did you go on with detailing these initial ideas?

We developed the idea of the elevated gardens between two day-units/classrooms. These elevated gardens were designed in such a way that they not only collected the rainwater from the roof, they were also visually visible from the interior of the classrooms in order to provide a strong indoor-outdoor connection. While developing all these details, we were very much influenced by the Fuji kindergarten. This kindergarten provided the children such an architecture/design/building, which was an experience on its own itself. Even the roof of that building was used as a play area. Every bit of it, the tree in the courtyard, the relationship of the interior spaces with the play area, everything... Everything was very flexible, giving room to play and so full of light... Everything was an experience... We tried to achieve similar design results in the inner courtyard of Levent, which was the main outdoor play area. We did not want to go higher than the ground floor, but at some places we had to. But we tried to limit this to certain focal

points. We added big slides to these spaces at the second floor and wanted to turn this disadvantage to an advantage by creating another experience opportunity. However, unfortunately due to economic reasons these were not realized.

Q5. What about what has been built? Such as the sliding windows and the semi open terraces extending to the private gardens?

After the building completed its one year, we had a very positive response from the users regarding the sun orientations. We have been told that they almost did not use mechanical cooling or heating. Or, in other words, they used it at a minimal level. For winter, we had no worries. However for summer months we had designed sun control elements/shading devices which were not built. But we were happy to discover that the semi open terraces themselves provided enough sun-control and that disturbing sunlight did not enter the classrooms. Regarding the terraces, our daughter, who is at the moment one of the users of this school, mentions that the teachers let them play there and that they sometimes even eat their ice creams at these terraces. The classrooms were close to the road. We had to design an external garden wall to protect the children. We were in this case concerned with the ventilation. We designed 'cuts' into this garden wall, to let the breeze pass through and enter the classrooms through the flexible, sliding glass doors. The teachers almost all the time have these doors/windows open.

Q6. What about other spaces. The entrance hall and the eating room...

There was a common play area in the entrance. In the same line of thought regarding the hierarchical relationship of nature and indoor spaces, we wanted the common play area have direct access to the common playground. According to us, we managed to establish

this relationship. Whereas the classrooms had direct access to their private little gardens, the main playroom had direct access to the main courtyard. Unfortunately they divided this playroom into two and made two extra classrooms. Initially was also had a detailed landscape design for the main courtyard. Unfortunately this landscaping project was never put into life.

Q7. Can you please tell us about the natural materials or colours which were a part of your design scheme?

On the building itself, we used natural cladding such as wood and yellow stone, which is so typical for Cyprus. Regarding the colours; on the island, there were already so many schools painted in very confusing and disturbing mixes of colours. We thought they were far too wild and confusing for children. As a decent protest to this trend, we choose an almost non-coloured scheme: Whitewash with three basic colours just at three second floor masses.

While discussing the colours to be used in interiors, we were advised by the teachers and the research we have made has also proved them right – bright colours were not advised since they triggered hyperactivity in some children. So, we tried to choose very soft, pastel colours. Tranquil, natural...

Going back to the entrance space... In the entrance, according to our initial design, there was a story-tree. According to our design scenario, children could sit under this tree and listen to fairy tales. You can have a look at the 3D renders and see for yourself.

Q8. The eating room looks very big and not domestic. Can you please comment on this?

When we made research regarding the standards of kindergarten design we found out that the maximum number of children in a kindergarten should be 120. Above that number another kindergarten should be organised for that neighbourhood. In Levent kindergarten, we were asked to design a building for 300 kids. We knew this was beyond the limits. We knew that there would be too much noise, and hence acoustical problems. We tried to overcome this through the suspended ceiling materials but we knew by default that the origin of the problem is the number of children. We could not do anything regarding that. We just informed our client but that was all.

The number of children also meant too many classrooms, and hence too long corridors. The children every day, with their little feet and steps have to walk a long way to go the eating hall. But to make this promenade easier for them, we tried to have openings at their eye level. And in front of the windows, we wanted it to be all greenery. We wanted kids to have a positive indoor-outdoor interaction.

Q9. Over the elevated gardens between two classrooms, there are gargoyles. Can you please tell us something about them?

The whole site had a serious water problem. We had no chance of collecting rainwater, but we could develop a special system trying to direct it to Nicosia rainwater collection system. In the elevated gardens, which are 1m high, cement shrinkages are hidden. At their bottom parts, there are metal grids and under them a cement floor. So the rainwater, coming from the roof and following the chains hanging from the gargoyles, runs down into the elevated gardens. The excess amount of waters goes down through the

shrinkages to the grid and then with a slope to the city rainwater collection system. Nicosia actually has a very nice system designed for this. But only if it had worked.

Q10. If you could imagine for a moment. If there were no economical constraints, do you think interiorscaping could be possible in Levent Kindergarten interiors?
In the examples we went through we saw examples of this in classrooms. Children were growing things in planters. Montessori education also talks about it. But according to me, it leads to a very domestic look. I personally would more prefer a more designedly, more contemporary/creative approach to interior landscaping. For example, I would design a big square pot, cladded with wood, of course with a good drainage system... It would definitely have to be a well detailed and designed touch.

Appendix 3

June 2013, Pilot Case Study: Levent Kindergarten

Teacher questionnaire – related to interaction with nature and kindergarten interiors

This questionnaire is a part of the study of Ibtisam Al- Sulaivany; graduate student of Eastern Mediterranean University, Department of Interior Architecture - done to test the concept of how interaction with nature affects children positively in kindergartens.

Please kindly state in what year were you born? 19 .....

What age group are you teaching now? (3, 4, 5?) .....

Could you please share with us the name of your classroom? .....

In your opinion, how much time a child needs each day to be in contact with nature? .....

Please indicate below in which aspect you think nature is more important to children's development.

a) Intellectually ☐
b) Socially ☐
c) Emotionally ☐
d) Physically ☐
e) Spiritually ☐
f) Academically ☐
g) Creativity ☐
h) Appetite – Nutrition ☐
i) Self-discipline ☐
j) All ☐

Please kindly state how far do you agree or disagree with the following statements.

There is an increasing amount of parents who are worried about their children spending more than seven hours each day in front of electronic media.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

More and more parents are worried about their children growing up without any close contact with nature.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

In my opinion interaction with nature has positive effects on the psychology of children.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

The broad area of glazing in Levent classrooms, allows more contact with nature and direct access to the private gardens.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree.

I think the semi- open terraces in Levent Kindergarten are important for children to maintain their contact with nature even when the weather is bad .

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I think that the day lighting, which is important for children's health is successfully designed in this nursery.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree.

In Levent Kindergarten, the preferred indoor colors are good for children.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

If, well planned in advance, using plant art or vegetation in Levent interiors could be possible and beneficial for children.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

The presence of plants in the kindergarten interiors could be good for purifying (clearing) the air and maintaining health.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

According to the current educational programme of Levent, the time (1-2 hours) the children are spending outside is sufficient.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

The elevated (1m high) little gardens, which are situated inbetween two Levent classrooms add extra value to indoor-outdoor interaction and give a positive feeling for the indoor users.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

As a teacher, when I consider the nature-interior space relationship provided in our school interiors, I feel lucky to be working here.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I think that the children are very efficiently using the private gardens in front of the day-units.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

The main courtyard of the school could be improved by improving landscaping and adding attractive natural play opportunities for children such as sandpits, fountains, trees etc...

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Please indicate which one of the following pictures you consider as appropriate for the entrance hall of your school. (Please feel free to pick more than one picture if you want to).

		
A	B	C

Appendix 4

English School of Kyrenia Project and Tables of Analysis

A new brand for new purpose-built a school under construction called English School in Bellapais in Kyrenia is designed by the architect Megaron. The area of the ground floor plan is 955 m sq and the total areas is 1339 m sq, 404 m sq for the first floor, and 1230 m sq for basement. The school trying to meet the educational needs of Northern Cyprus combines the traditional values of the English education system with the modern facilities required for success in the 21st century. Facilities for supporting learning are joined by facilities for sport and the creative arts. In September 2008 Prep and Pre-Prep School was opened. The school and its campus at the moment provide the most up-to-

date and extensive facilities of any school on the island, north or south. The buildings opened for both Primary and Secondary for all age of students from September 2009. Curricula in recent years, encourages the development of active learning and inquisitive. The aim is to make Children independent learners through their home language (Turkish) and English through the classes which are in English to gain fluency and there is a tutor in Turkish in order to help pupils to be able to converse comfortably in both languages (URL 91).

Table 18: Plans and Photos of English School Project in Kyrenia, North Cyprus (Author)

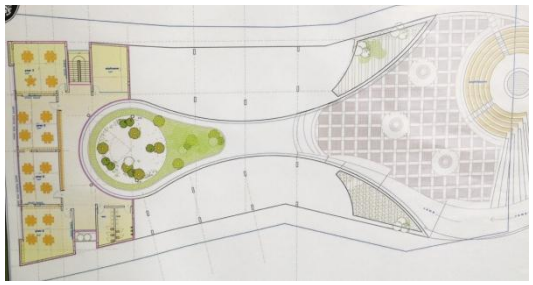
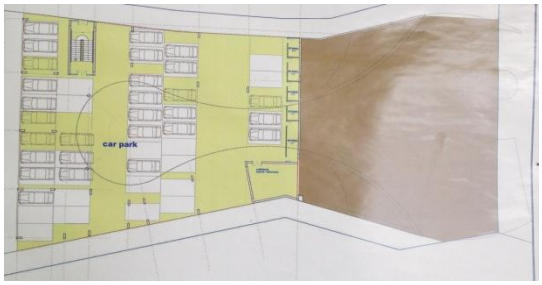
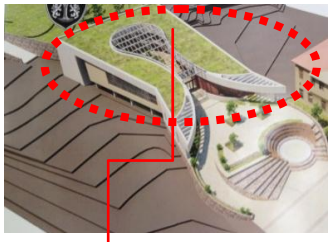
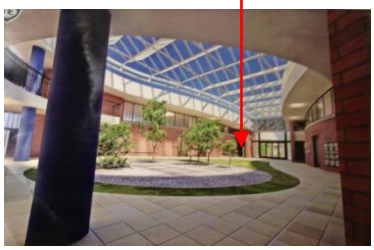
General Information	
	
The project is under construction	
 	 Ground floor  First floor
	 Basement

Table19: Analysis Criteria for Architectural and Interior Elements (Author)

Architectural criteria		
Courtyard / backyards	Terraces	Green roof
		
		

Architectural criteria			Planes			Surfaces					Objects		Light	
Courtyard	Terraces	Green roof	Vertical garden	Elevated garden	Interior garden	Texture		Materials		Colors	Art Element	Furniture	Large windows	Skylight
■	■	■			■			■		■	■		■	■

The tables (18) and (19) show the analysis of the English School of Kyrenia Project. The interior spaces of this kindergarten have relationship with nature through the architectural criteria (courtyard, terrace, and green roof). As well as the interior architectural criteria (interior garden, natural materials, art element, skylight and big windows). Green roof is the distinctive element that found here and not found in Levent kindergarten.