

Analyzing Preschool Education Models in Architectural Design



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 Received: 03.04.2021
 Accepted: 26.05.2021
 DOI: 10.17932/IAU.ARCH.2015.017/arch_v07i1003

Abstract: *Pre-school period is the most critical period for children in which the child develops rapidly with high learning potential. Therefore, it is important to look after children and give them the possibility to develop well during this period. During this time, the physical environment affects child's body, movement, mind, language, emotions and social development. So, the aim of the study is to design educational environment that can meet the needs of the child and support its development while planning pre-school education institutions. In this study, interior and exterior parts of a standards preschool education model and common education models are analyzed. Then, the most common Training Montessori Kindergarten İhsan Doğramacı has been architecturally analyzed. The interior and exterior spaces and various parts of the Montessori classes are well examined in terms of the physical environment criteria of Montessori education model. The results show, the capacity of the school's existing architecture and materials has direct effect on the quality of the education which usually reduces the quality. However, when deficiencies are eliminated by adhering to the principles, the quality of education will rise. This research was conducted based on available data, observation, on-site inspection and structured interviews.*

Keywords: *Pre-school education, educational environment, Montessori education, architectural design*

Okul Öncesi Eğitim Modellerinin Mimari Tasarımda İncelenmesi

Öz: *Okul öncesi dönemde fiziksel çevre çocuğun zihin, beden, hareket, konuşma, psikolojik ve sosyal gelişiminde önemlidir. Bu çalışmadaki amaç, okul öncesi eğitim kurumlarını planlarken, çocuğun ihtiyaçlarını karşılayabilecek ve gelişimini destekleyecek nitelikte bir eğitim ortamının tasarlanmasının vurgulanmasıdır. Bu çalışmada okul öncesi eğitimin fiziksel mekânları, iç ve dış mekânların oluşturduğu bölümler standartlara uygunluğu incelenmiştir, ayrıca dünya üzerinde farklı eğitim modelleri incelenmiştir. Çalışmada Türkiye'deki en yaygın eğitim modellerin Montessori Eğitimi'nin Konya'daki Selçuk Üniversitesi İhsan Doğramacı Montessori Anaokulu mimari açıdan analiz edilmiştir. Okuldaki fiziksel ortamlar iç ve dış mekânlar ve Montessori sınıfların oluşturduğu bölümler Montessori eğitim modelinin fiziki ortam kriterleri açısından incelenmektedir. Yapılan analizler sonucunda, İhsan Doğramacı Anaokulu eğitiminin ilkelerini mümkün olduğunca uygulamaya çalışan bir okul olmasına rağmen okulun mevcut mimarisi ve materyallerin yetersizliği eğitimin kalitesini düşürmektedir. İlkelere bağlı kalarak eksiklikler giderildiğinde eğitimin kalitesi de yükselecektir. Araştırma çalışmasının bu doğrultusunda yol gösterici olacağı inancındayım.*

Anahtar Kelimeler: *Okul öncesi eğitim, eğitim ortamı, Montessori eğitim, mimari tasarım*

1. INTRODUCTION

Pre-school education covers the year between 0-6 and plays an important role in the later life of children. It is an educational process in which children physical, psycho-motor, social-emotional, mental and

language developments are completed and their personality is shaped [1]. The foundations of the bad habits such as anxiety disorders, personal irregularities, excessive digital addictions and TV addiction in the future life of children are laid in the preschool period [1]. Therefore, preschool education is very important and it is the period when all aspects of the developments are most interrelated compared to other periods of the life [2]. In today's education system, the institutions that provide education to the children and support their development are called pre-school education institutions [3].

In recent years, educators, architects, and researchers have revealed that the design of the classrooms greatly influences children's behavior. In this study, it is tried to examine the relevant literature on what qualities the kindergartens should be designed in order to assure children to lead a healthier and more efficient life and support its development while planning pre-school education institutions. Within the scope of the study, technical drawings and images were used in the preparation of preschool plans. In the examination of the preschool, methods such as observation, on-site inspection, one-to-one interviews with educators and students were used.

2. CHILDREN AND EDUCATION













Design of the educational institutions consists of two important architectural structure features: institutional architecture and learning areas that reflect the pedagogical aspect of education [4]. While the institutional architecture reflects the side of the physical space related to the exterior spaces and its appearance, the educational environments reflect the pedagogical side of education can be affected by educational phenomena such as the teaching models to be used. For instance, an educational environment in which "Multiple Intelligence Theory" is used should be consist of unstable sequences and the field should be suitable for changing effectively and rapidly [5].

2.1. Planning Principles of Kindergarten

Interior principles:

The interior space arrangements in pre-school education institutions such as doors, windows and floors need to be visible from outside the building. Another factor that should be considered in interior arrangement is the provision of materials. Since the achievements and indicators of the program should be considered before planning; at this point, it should not be forgotten that the teacher has a big role in organization of the classroom [6]. Early childhood education centers in the United States covers six main areas: outdoor spaces, classrooms, multi-purpose room, healthcare area, teacher workspace and executive office. All areas in early childhood centers should be easily accessible for children with disabilities and comply with all local accessibility rules of the "American Disability Movement" [7].

Table 1. Places in Pre-School Education

		
<i>Executive Room</i>	<i>Cloakroom</i>	<i>Multi-Purpose Hall</i>
		
<i>Multi-Purpose Hall</i>	<i>Multi-Purpose Hall</i>	<i>Infirmary Room</i>
		
<i>Kindergarten Kitchen</i>	<i>Game Room</i>	<i>Game Room</i>
		
<i>Kindergarten Toilet</i>	<i>Kindergarten Toilet</i>	<i>Kindergarten Teacher Room</i>

Cloakroom: It is the area where children change their clothes and shoes. These areas should be located in the entrance and exit sections of the schools in line with their intended use. The floor structure of cloakroom needs to be made with non-slip material [8].

Executive room: This section should be located close to the central entrance to control the entrance and exit of the staffs [7].

Multipurpose hall: Multipurpose halls used to meet the needs of nutrition and large group events. If there are no separate areas for parents and volunteers, these halls also can be used for such activities. Moreover, this area can accommodate family seminars and reading space (informative books and materials for families) [8].

Teacher workspace: Usually, this area used for teacher's preparations and rest. It is also used for telephone conversations, group reading events and collaborative planning activities. This room should be equipped with computer, photocopy machine, professional library and television should be available, teachers should be provided with locked access to their private areas [7].

Infirmary: In this area, the health status of the children is checked. The infirmary staff must be doctors or nurses, and this room should be equipped with first-aid equipment, a sink and washable floor. This area at pre-school education institutions should be located in as far as possible from the playrooms [8].

Game room: It is the most important room in the kindergartens and has the most essential functions, should be handled with great care. The dimensional characteristics of the playroom should be adjusted according to the use, capacity and variety of activities [28]. Where there is no additional playroom in pre-school education institutions; we can hall, wide corridors, class breaks, etc. as game room [8].

Dining room and kitchen: It is important to pay attention to the sanitary and conditions of the dining room and kitchen areas, ventilation is important, and to provide better services the two areas should be located side by side. Furthermore, care should be taken to ensure the height and dimensions of the chairs are suitable for the children [9].

Toilets: Toilets should be located close to classrooms and washbasins should be adjusted based on the children's height [23] and they should be cleaned on a regular basis. Necessary precautions must be in place to prevent children from slipping on wet ground [27]. Child could move freely, it should allow individual and group activities, it should be aesthetic and its heating, lighting, ventilation and cleaning should be suitable for health care conditions [10]. While organizing activity areas in preschool education institutions, the arrangement of heat, light, materials, furniture and other materials in an integrity and the interaction of these areas with each other is a very important factor, the arrangement of educational environments in pre-school education institutions affects children's development, behavior and communication with each other and adults [11]. Creating spaces that allow large and small groups to come together at certain times within the scope of pre-school education program is also an important factor [9]. The materials and environment in the mostly established centers provide clues as to how many children can work here. The use of Figures and stickers that can be a clue about the number of children who can spend their time in the learning centers in the classroom makes this situation easily understood by children [6]. Furniture in the classroom should be suitable for the age group and developmental characteristics of the children, dangerous situations such as sharp corners of furniture, nailed nails should be checked and if the furniture is painted, the paint should be of a quality that will not harm children [9]. Furniture with fragile parts such as glass and mirrors should not be included in the classroom, while classroom furniture should be easy to clean, multifunctional, easily transportable and in harmonious

colors [25]. Bright and dim areas can be created for different learning centers, where light and shadows can be used indoors [11]. However, it is extremely important to choose light colors so that the colors used in the classroom create a natural atmosphere and make small areas appear wider than they are [8].

Outdoor principles

The outdoor spaces of pre-school education institutions are considered as an extension of the education given indoors and as environments that serve to reinforce the experiences gained evaluated in this area. These areas are designed considering the developmental characteristics of the children.

Table 2. The Outdoor Spaces Places in Pre-School Education

		
<p><i>Play in Open Areas</i></p>	<p><i>Play in Open Areas</i></p>	<p><i>Play in Open Areas</i></p>
		
<p><i>Move Freely</i></p>	<p><i>Exploring in Open Areas</i></p>	<p><i>Physical Movement</i></p>

Children can learn as much as they experience, the outdoor areas have great effects in child development, as playing in open spaces together with the processes of discovery and experience. Outdoor spaces prepare the ground for children to use their creativity, to establish a relationship with nature, to socialize and to move freely [26]. Physical movement is important for the child to use his / her ability to move frequently during the day in the preschool period. However, although institutions pay attention to the creation of an environment that will encourage children's large and small muscle activities, they neglect to provide opportunities for large muscle movement. Preschool education qualifications that should be in outdoor spaces; The playground should be built next to the classroom, there should be at least 10 square meters of space for each child. sunny and shady areas should be balanced, there should be large, grass-covered areas for children's games and major muscle activities, covered areas for children to play in very hot and very cold weather conditions must be found and playgrounds should be designed for both, group activities and individual activities [12]. In a school, children want to feel safe. The areas in the schools are very effective in children's learning, if the structure of the buildings meets the individual needs and expectations of the children, no doubt, children will feel better there. Along with expectations, school areas should also be free from dangers, child who feels safe will exhibit more positive behavior both academically and socially [13].

3. PRESCHOOL EDUCATION MODELS AROUND THE WORLD

Different models are applied in preschool education. They are, Reggio Emilia Alternative Education, High Scope schools, Waldorf schools, Montessori schools, Forest schools, Head Start schools and Summerhill schools [14]. The most common of them are listed below.

Table 3. Comparison of the Approaches of Reggio Emilia, High Scope, Waldorf, Montessori and Forest Schools in Terms of the Educational Environment.

Approaches	Class Environment	Materials and places
<p>Reggio Emilia</p> 	<ul style="list-style-type: none"> • A natural home environment, places that resemble the city areas called “Piazza” 	<ul style="list-style-type: none"> • Studio and laboratory • Natural material (clay, sand, wood)
<p>High Scope</p> 	<ul style="list-style-type: none"> • Angular environments where children can make discoveries in which they feel related 	<ul style="list-style-type: none"> • ‘Corner of interest’ Math corner, game corner, book corner • Materials Transparent boxes on suitable low shelves
<p>Waldorf</p> 	<ul style="list-style-type: none"> • Natural classroom environments • Feeding with the nature 	<ul style="list-style-type: none"> • Nature table • No plastic materials and electronic tools
<p>Montessori</p> 	<ul style="list-style-type: none"> • Flexible, child – dependent environment • Carpets laid on the floor 	<ul style="list-style-type: none"> • Corner spaces • Sensory materials • Math materials
<p>Forest Kindergartens</p> 	<ul style="list-style-type: none"> • Natural environment • Schools without walls 	<ul style="list-style-type: none"> • Natural environment • Water • Soil

Table 4. Comparison of the Approaches of Reggio Emilia, High Scope, Waldorf, Montessori and Forest Schools from the Theoretical Basis

Approaches	Theoretical Basis	
	Purpose of Education	Focal Points
<p>Reggio Emilia</p> 	<p>Ensuring that the child can overcome the "walls" that prevent the child's development.</p>	<p>The focus is on the child's expression of herself in a symbolic way, which is conceptualized as "child's facial language".</p>
<p>High Scope</p> 	<p>Helping children develop their ability to make choices and make decisions about what to do and how.</p>	<p>The focus is on "active learning, positive adult-child interactions, a tolerant learning environment for children, a consistent daily flow, making daily evaluations of children by a team, family participation".</p>
<p>Waldorf</p> 	<p>With the help of art, the development of emotion and thought in the child and finally the development of self-consciousness.</p>	<p>The focus is on 'fully educating the child' through 'art'. 'Brain, heart and hands' constitute the basic philosophy of this program.</p>
<p>Montessori</p> 	<p>Developing the child's ability to take individual responsibility.</p>	<p>Expressed with the concept of 'absorbing mind', the focus has been on the child's absorption of her environment and experiences from birth.</p>
<p>Forest Schools</p> 	<p>It has been determined that the children who attended these schools are more socially competent, able to communicate better, and more curious. In addition to that, they have healthier bodies.</p>	<p>The only goal is to create an environment that is durable in all seasons, where they can always be free, where they are not stuck between four walls.</p>

Table 5. What are the similarities / differences of these education systems?

Approaches	Reggio Emilia	High Scope	Waldorf	Montessori	Forest Schools
Founder	Loris Malaguzzi (1920-1994)	David Weikart (1960-1970)	Rudolf Steiner (1861-1925)	Dr. Maria Montessori (1870-1952)	Forest School members (2002-2011)
Philosophy of	Children's own interest field and education based on learning speed	Active learning by doing the experiences initiated by the child	Based on art imagination, creativity, common sense training for development	Children's own interest Field and Education based on learning speed	It is an inspiring method that provides an environment where children can develop self-confidence and self-esteem in the forest.
Media type	Teacher in the collaborator role	The teacher is in the role of "active learner, effective communicator, careful observer and planner-environmental organizer".	Teacher in the role of manager (Children the same with the teacher, it goes on for 8 years, family type class logic)	Teacher in the role of guide (varies with each group)	Teacher in the executive role (one teacher for every four students)
Used materials	Teachers prepare toys together with students	From materials such as chalkboards, blocks, sand and water children make creative games with support of teacher	Natural wood fabric, wool, paint, etc. are used and students prepare their own toys	Teacher teaches the concepts from materials such as natural wood and fabric specially prepared toys using it with a teacher	There are natural materials such as sand, water, mud. students make shelter from wood
Teacher blow	Children work in groups on longer term projects of their own interest	The child learns by living through his own experiences	Children work as a classroom on projects that increase their imagination and creativity.	Children take care of themselves in groups they work on the subject	An interest-oriented learning method managed by the child is applied
View of art	Art is handled within the framework of teamwork where they can use their creativity like every subject.	Effective learning with artistic experiences	There is a very heavy and detailed art education	Art is treated as part of other subjects	Art activities, entertainment and education seem to be intertwined
Technology overview	Technology is an auxiliary part of education	Computer corner is available as one of the training areas	Technology is absolutely absent, in theory thought to hinder creativity	Technology is absolutely absent, in theory it is thought to hinder creativity, but it is being discussed.	Technology is absolutely absent
Special education overview	Examples adapted to special education available a suitable system		Special education with the understanding that one subject is behind another subject.	Special education is very suitable, as everyone progresses at their own pace and capacity.	Examples adapted to special education; a suitable system available
Activities	Group studies supporting creative thinking	Fun science, creative drama, painting and visual arts, sports, music, thinking education, nature, environment and museum visits etc.	Picture-music gardening, handicraft knitting and wood carving, metalwork etc.	Science, geography, games used in traditional forms of education for the concepts of mathematics, language development	Making toys and building shelters
Grade system	Don't pass, don't stay, grading is out of the question in pre-school education.		Don't pass, don't stay, no grading, the child who is back in one field is good in another	Don't pass, don't stay, grading is not in theory, but schools can have different approaches	Don't pass, don't stay, no grading

4. CASE STUDY

Konya, the largest province and the seventh most populous city in Turkey in terms of surface area.

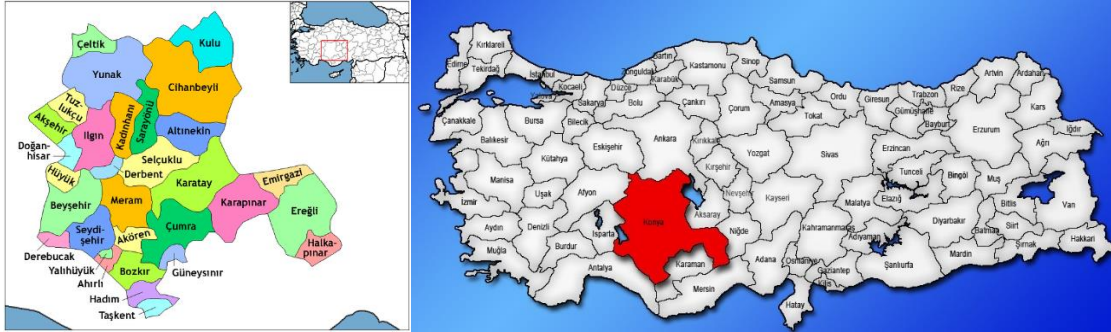


Figure 1. Konya Map



Figure 2. Location of İhsan Doğramacı Kindergarten
Konya Selçuk University İhsan Doğramacı Montessori Kindergarten

4.2. İhsan Doğramacı Montessori Kindergarten Approach

İhsan Doğramacı Practice Kindergarten provides education services under the Faculty of Health Sciences, Selçuk University, in order to prepare children aged 0-6 for life. Started to apply the “Montessori Education Model” as an alternative education model for children, parents were informed about this education model through various seminars and meetings. The Montessori education model is widely applied all over the world, its general purpose is to help the child for the independence of the child, to gain a sense of responsibility in free choices, to make experiences for self-realization, to make him look at the world safely and peacefully, to keep his culture alive, and to establish the awareness of the protection of natural balance [15]. Planning in Montessori classes is done individually in line with the development areas of the child; classroom environment is arranged with materials that the child can easily reach. Maria Montessori called this the preparatory environment [16]. One piece of these materials is presented to the child in an orderly manner, materials are not toying but a study tool, every material has a purpose; the child learns how to work with these materials by working with the teacher one by one. In this educational model, the toy is replaced by material, and structured games are replaced by work [17]. Studies are divided into five main groups which are mentioned below;

1. Daily life applications
2. Working with sensory materials
3. Working with math materials
4. Working with language materials
5. Working with cosmic educational materials



Figure 3-4. Daily Activities



Figure 5-6. Daily Activities



Figure 7-8. Daily Activities



Figure 9-10. Daily Activities

There are no divided time zones within this educational model. Uninterrupted training is given especially in the mornings. The age group is mixed, meaning there are students from all age groups (3–6 years) in a class. While one teacher works with one student, the other teacher and assistant takes care of the other children. After the adaptation process of the children to the classroom is completed, a calm and quiet classroom atmosphere is formed by children who are committed to studying. Students who want to relax can relax in the classroom or in the recreation room. In the afternoon, children can continue to work if they want to, if they do not want to watch documentaries, they can participate in art activities, games, music, and story listening activities. There are students from all age groups (3–6 years) in a class.

The other educational model used by students of 3-6 age group at school is the same as the Montessori education model in terms of its purposes, but it differs in terms of practices and educational materials, the general purpose of this educational model is to ensure that children become healthy individuals who are self-sufficient in cognitive, social, spiritual, physical and language fields. In these programs, there are goals and achievements that support the development of the child in all aspects. The teacher plans educational activities in line with the interests and needs of the child, taking into account individual differences. Activities are divided into processes such as leisure time, Turkish, science-mathematics, music, play and movement, rest, art, and preparation for reading and writing. Activities continue with smooth transitions with the personality and experience of the teacher. The class consists of corners of interest; these are house corner, block corner, puppet corner, book corner, music corner, science-nature corner, Atatürk corner. Children spend time in these corners in their free time, games, music and Turkish activities are held in groups, but children who do not participate are not forced. Since art activities are diverse (paper folding, salt ceramics, painting, collage, etc.), children work according to their own preferences. Classes are arranged according to age groups. (Such as 3-4, 4-5, 5-6 years).

4.3. Plans and Spaces from Montessori Kindergarten

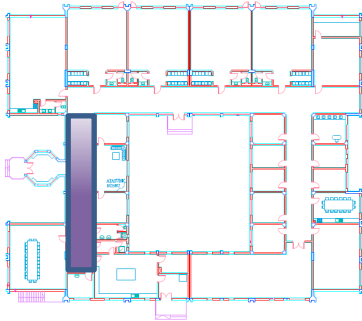


Figure 11-12. Building entrance

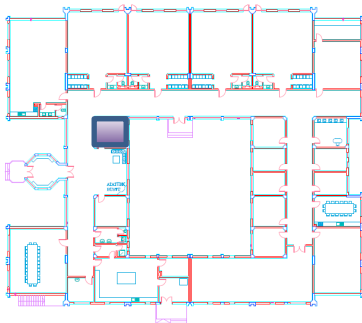


Figure 13-14. Teachers' room

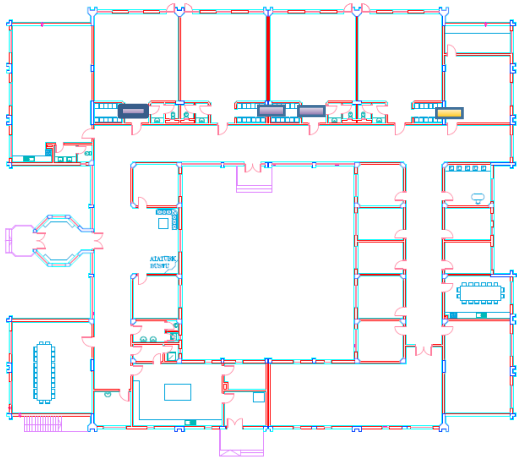


Figure 15-16. Cloakroom

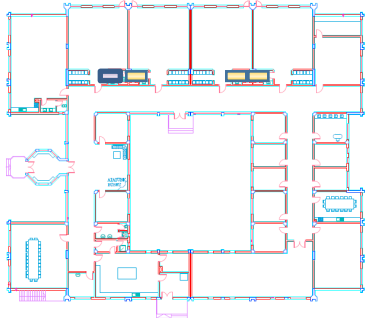


Figure 17-18. Toilet

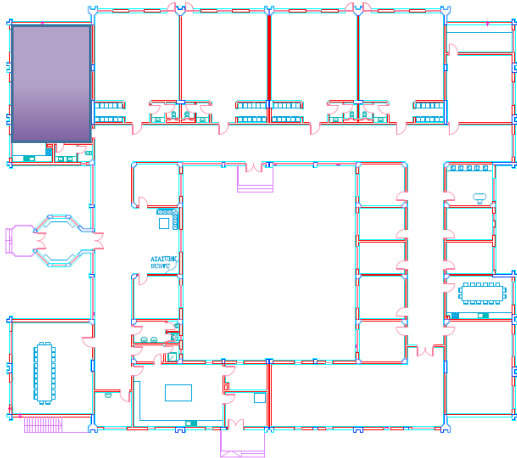


Figure 19. Class (0-3) children

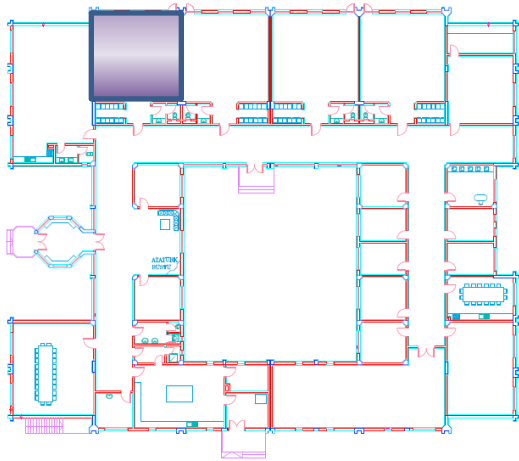


Figure 20 Class

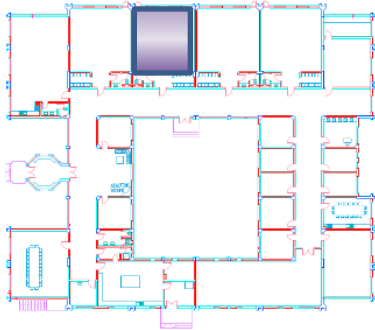


Figure 21. Class

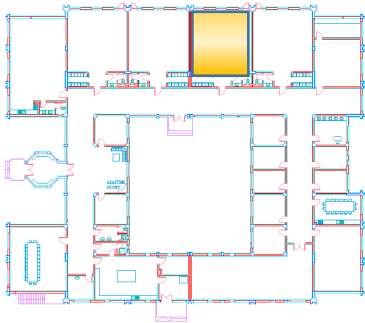


Figure 22. Class

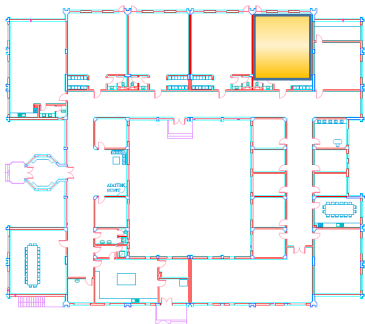


Figure 23. Class

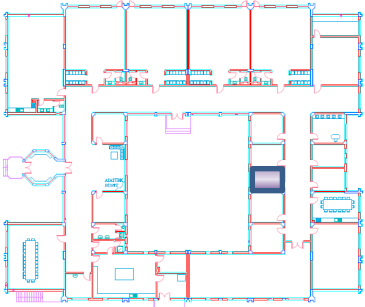


Figure 24. Chess Room

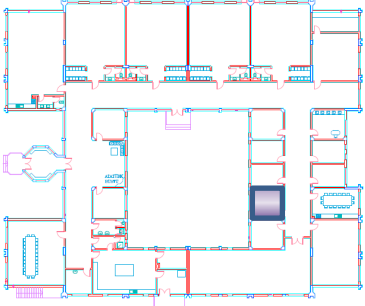


Figure 25. Art Room

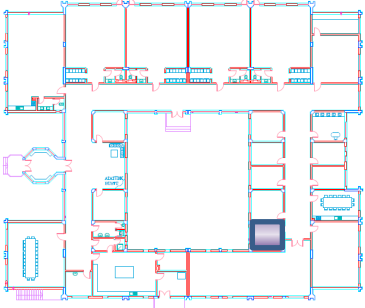


Figure 26. Nursery Class

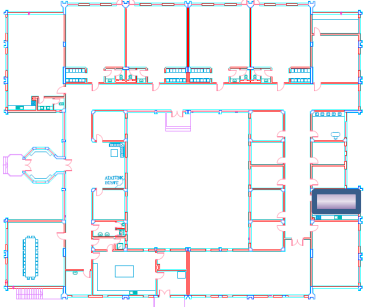


Figure 27. Children's Kitchen

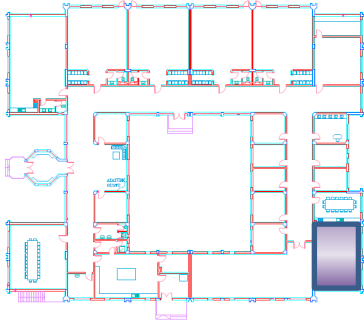


Figure 28. Children's Kitchen

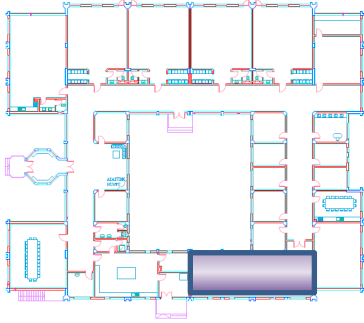


Figure 29. Sleeping Room

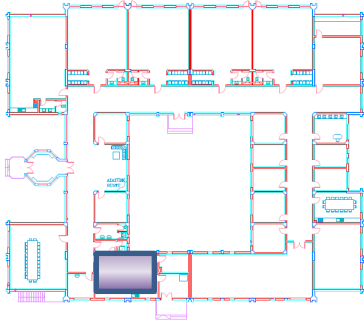


Figure 30. Kitchen Hall

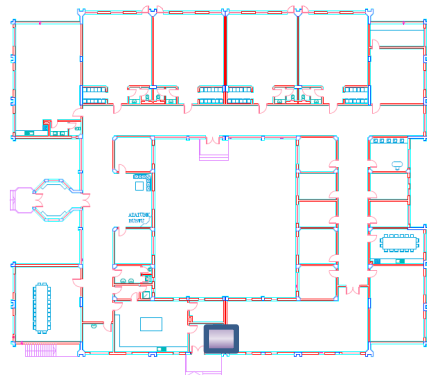


Figure 31. Infirmary Room

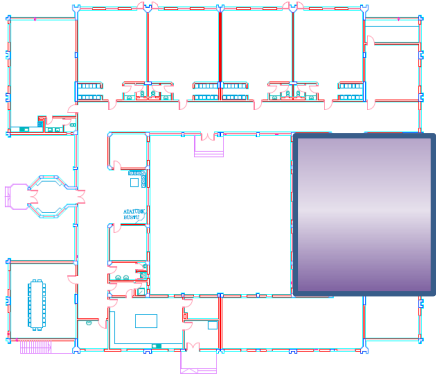


Figure 32. Playground

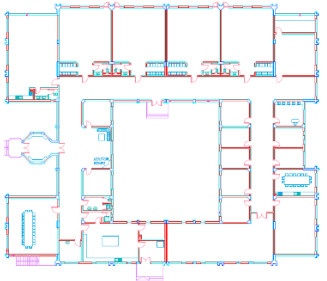


Figure 33. Back yard



Figure 34. Back Yard Entry View

5. CONCLUSION AND RECOMMENDATIONS

The results show that physical environment affects human behavior, child learning development and growth. The following conclusions have been reached:

- According to Montessori, children educational environment needs to be well-equipped and quality material should be considered.
- A multi-purpose landscaping in the kindergarten offers the children with problem-solving opportunities,
- As a result, İhsan Dođramacı Kindergarten, where Montessori education is given, covers the minimum places required by alternative education, but there is insufficient use of indoor and outdoor spaces.
- Moreover, there are inadequacies in interior design; there is no library and reading spaces, computer, photocopy machine and television is not provided in the teacher's room. In addition to that, it is important to position the dining room and kitchen areas side by side, it is observed that there are deficiencies in outdoor design (water and sand pool) as well. Soil, sand and water provide opportunities for experience, exploration and creativity.
- Considering the examined models in this study, future preschool education architecture design has to take into account those deficiencies in the interior and exterior spaces.

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