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ORTOPEDİK ENGELLİ ÖĞRENCİLERİ İÇİN OKUL BAHÇESİNİN ÖNEMİ THE IMPORTANCE OF SCHOOL GARDEN FOR STUDENTS WITH ORTHOPEDIC DISABILITIES

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Abstract

Children with orthopedic disabilities (and their families) are constantly challenged when it comes to connecting with the natural environment. School gardens can significantly compensate for this lack of touch with nature. The present article examines the current status of green play environments in Ankara and aims to offer an optimized plan for designing the Dogan Chalar Special Education School garden. To plan the school garden, a multi-method approach was employed which incorporated cognitive presentation, a survey of the concerns and opinions of the parents of students with orthopedic disabilities, and interviews with such students themselves and their teachers. The findings provide both a model for the utilization of school grounds to improve children's educational development and social interactions and a helpful source for professional designers of school gardens.

Keywords: School Garden, Special Education, Disabled Children, Orthopedic Disability, Ankara.

1. Introduction

A large body of research highlights the importance of interacting with nature and its effect on the development of children with disabilities. Certain elements in the natural environment such as trees, grass, water, visible sky, rocks, flowers and birds have been mentioned as particularly helpful (Olds, 1989; 27-30; Cooper-Marcus & Barnes 1995; 15-20; Ulrich, 1999; 53-60; Kaplan & Kaplan, 1990; 239-241; Pouya & Demirel, 2015; 5-7; Pouya et al 2016a; 57-58; Pouya et al, 2016b; 52-55). In an international study on the experience of growing up in big cities, Lynch (1977) also showed that children universally admired vegetation. It has also been pointed out that natural environments represent dynamic and rough playscapes that challenge motor activity in disabled children (Wells & Evans, 2003; 311-320). Children with disabilities, like all children, should be able to take part in outdoors recreational activities. This becomes crucially important given the role game playing has in a child's development. Research indicates that children in natural settings play and learn with more vigor, engagement, imagination, and cooperation than those who play on artificial surfaces. Playing in a green space can help develop speech, sensory skills, imagination, independence and social skills. It is crucial that all children, regardless of their abilities or disabilities, are given the opportunity to play in and access to adequately-equipped facilities (Sutton, 2008; 537-539). Such activities are beneficial to the child's social, emotional and physical development (Murphy & Carbone, 2008). Researchers have also shown that people with disabilities who are physically active: "(a) are better adjusted and more satisfied with life, (b) report having fewer days of pain, depression, anxiety, sleeplessness, improved vitality, and (c) substantially increase their life expectancy" (Krause & Kjorsvig, 1992; 558-560).

Connecting with the natural environment is one of the challenges children with disabilities, and their families, especially grapple with, which at least partially explains why children with disabilities spend more time watching television and playing video games than they do being physically active outdoors (Natural Learning Initiative, 2012). In this regard, school gardens can greatly compensate for said lack of sufficient access to nature and address this problem in a practical way.

According to Titman (1994), children looked for four elements in a school garden: a place for playing around (opportunities for bodily activities); a place for meditation (opportunities for subjective stimulation); a

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place for excitement (to stimulate their feeling); and finally, a place for existence (to allow them to be themselves). Titman focused on the importance of optimally-planned school grounds as an educational resource to show how they helped improve students' trends, manners and learning skills. School gardens, in addition, are conducive to observation, research and problem-solving which make them flexible facilities often more readily suitable to shift in user provisions than the school building itself (Hussein, 2017; 149-153).

School gardens have, as a matter of fact, been regarded as a main resource that provides the most natural process for children's acquisition of knowledge and realization (Broadhead & Aalsvoort, 2009; 5-7; Moyles, 2010; 2-10). School gardens have also been shown to result in higher movement (Said, 2008; 32) or mobility (Kytta, 2003; 109-115) in children's lives, which in turn helps children perceive information from their surrounding environment and better develop certain skills (Meire, 2007; 29-77). By letting children manipulate the space using their imagination, school gardens facilitate the development of creativity (Hussein, 2017; 148-159). Literature also indicates the positive effect on the overall health and wellbeing of children school gardens can have through increased social interaction (Soltani et al., 2012; 670-671).

School gardens can stimulate many applied activities that students with special needs can benefit from. They can help induce in the student a rewarding experience and, thus, influences their manner and indirectly helps develop their social relationships (Titman, 1994; 3-14, Lucas, 1996; 26-28, Stoneham, 1997 and Moore, 1999; 330-371). When involved in game-like tasks performed in the school garden, students are more probable to succeed than when they receive instructions through traditional academic learning techniques. The benefits and advantages of learning in natural environments are coming to light (Stoneham, 1996; 5-16).

Even though the role of school gardens as a therapeutic environment in special education schools has long been recognized (Long and Haigh, 1992;103-105; Cavet and Mount, 1995; 53; Harris and Dines, 2005; 20-46), little empirical data exists on school garden planning and designing. The present articles aims to examine the current status of green play environments in Ankara in terms of the satisfaction level of children with disabilities and their families and to offer an optimized plan for designing the Dogan Chalar Special Education School garden. In order to plan a school garden specifically designed for children with disabilities, it is imperative to have a firm grasp of children's needs and the implications that disabilities can have on children. The findings provide both a model for the utilization of school grounds to improve children's educational development and social interactions and a helpful source for professional designers of school gardens.

2. Material and Method

2.1. Dogan Chaglar Orthopedic Special Education School In Ankara

The present study was carried out at the Dogan Chaglar Middle School for children with orthopedic disabilities, located in Ankara city, which is regulated by the Ministry of Education (Figure 1). The school is named after Professor Dogan Chalar for his 1997 research in and contributions to the field of special education studies. This 6,408 m² school consists of a single-storey building that suitably accommodates orthopedically disabled children (Dogan Chaglar special school, 2014; Pouya et al, 2016c, 60-70).

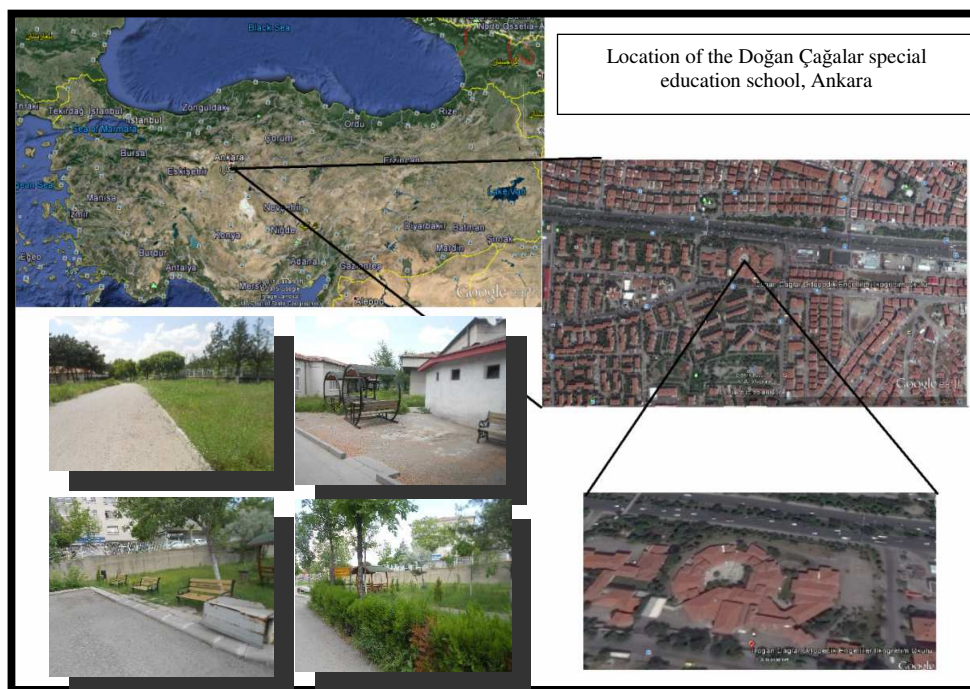


Figure 1. Case study area; the Dogan Chalar special education school, Ankara

The school consists of 13 classrooms, 1 infirmary, 1 gym, 1 kitchen, 1 set of restroom, 1 technical service workshops, 1 dining hall, laundry, administrative offices and 3 dormitories each accommodating 12 beds. All ground-floor units and all utilities in the dormitories were especially-designed to be wheelchair accessible in sections connected by ramps. Classrooms, dormitories and entrance hall opens onto the garden with a center gate.

Windows have been incorporated into all sides so that all units receive plenty of sun exposure and fresh air. The inner courtyard around which the buildings have been made with an area of 1,000 m² which houses many trees is, however, useless to the students. The area has no recreational equipment, but include a few pavilions built in the centre that are used by parents.

The school has a sum of 82 students all with orthopedic disabilities, many with concurrent hearing and mental impairments. The majority of the students are on wheelchairs, while others use walking sticks (Dogan Chalar special school, 2014) (Table 1). This study used a multi-method approach which incorporated cognitive presentation, a survey of the concerns and opinions of the parents of students with orthopedic disabilities, and interviews with such students themselves and their teachers. The data gathered through this approach gave a clear picture of the needs and demands of school children.

Table 1: Numbers of members in Doğan Çağalar Orthopedic special education

	Number of male	Number of female	Total
Director	-	1	1
Assistant directors	1	3	4
Teachers	9	14	21
Students	21	61	82
Staff	4	3	7
Nurse	1	-	1
Security Personnel	-	3	3
Total	36	76	112

First, in order to provide the children and their parents and teachers with a mental image of the school garden, a cognitive presentation was given specially to get the children excited about the kinds of activities they



could do in the garden. The video in the presentation also provided information that would guide the audience through the surveys and the questionnaires. The presentation included pictures of some of the many existing school gardens from around the world and also of the types of activities that such gardens enabled children with orthopedic disabilities perform (Figure 2).

Of the children's parents, 29 were surveyed who were mostly female. Consisting of multiple-choice and open-ended questions and based on the Likert 5-point Scale, the survey had 2 main parts. The first part, formed of 14 questions, addressed the socio-economic characteristics of the parents through general questions on the age, level of education, income, perception of the child and the disability; the second part, on the other hand, focused on the students' behavior in the garden and on identifying the problems they may encounter. Gathering data on their children's interests and needs was also in mind.

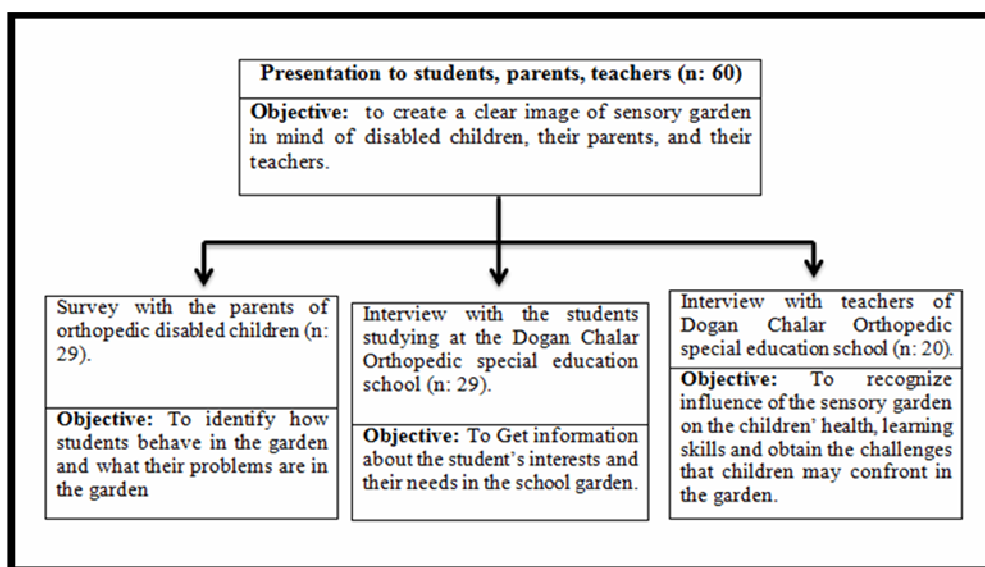


Figure 2. Summary of the data collection the site

Children, with or without disabilities, tend to engage in various activities depending on their respective age group many of which are limited to parks and playgrounds. Disabilities, however, might, and more often than not does, impede children from pursuing their favorite activities. In this regard, the interviews with the students focused on what kinds of activities they find more attractive and also more suitable with regard to their specific disabilities. While children with disabilities express expectations and interests that do not meaningfully differ from those shown by children without disabilities, the former obviously have special needs. Taking this into consideration, designers are able to better tailor school gardens to the needs of disabled students which will warrant a higher level of their satisfaction as a population.

To this purpose, 29 students with physical disabilities were interviewed. Participants were shown a series of pictures of school gardens and the different kinds of activities such gardens accommodate, and their affective responses and levels of interest in each activity were recorded. The last series of interviews were with 10 teachers to obtain their perspectives on the possible problems children might have to deal with in the garden and also to poll the teachers' views on the influence of a sensory garden on the health, learning skills of the students.

3. Results

3.1. Results Of Survey With Parents

The parents of 13 female and 16 male students with disabilities participated in the survey. The students' ages ranged from 8-15 with an average of around 10 years old. 48% of male parents were self-employed and all female parents were housewives. The parents' level of education was primary and secondary school.

The analysis of the survey showed that 79.3% of the students had used a wheelchair in the past. 62.1% of the students also had concurrent mental problems in addition to physical disabilities and %27.6 of them suffered from speech problems too. Problems faced by individuals with physical impairments included poor muscle



control, weakness and fatigue, difficulty walking, talking, seeing, speaking, sensing or grasping (due to pain or weakness), difficulty reaching for things, and difficulty doing complex or compound manipulations (push and turn). Some individuals with severe physical disabilities would not be able to operate even well-designed products directly. These individuals usually relied on assistive devices which take advantage of their specific abilities and on their ability to use these assistive devices with standard features. Commonly used assistive devices include mobility aids (e.g., crutches, and wheelchairs), manipulation aids (e.g., prosthetics, orthotics, and reachers) communication aids (e.g., single switch-based artificial voice), and computer/device interface aids.

Respondents were also asked how they evaluated their free time with the children. The analysis showed that 25.9% of them watched TV at home, 20.9% of them tended to rest at home, 19.2% of them visited relatives and 11.7% of them spend free time in the parks or another green space. It was concluded that that parents of disabled children preferred to spend their free time at home and not go outdoors. The reasons and motives were traced back to the different issues that the children with disabilities and their parents encounter outdoors.

23% of parents with disabled children would not go out to green spaces, of which 38.9% stated their main problem was transportation, 23.7% were disturbed by the reaction of people outside. It was found that 58.9% of parents preferred weekdays for going out, with 5.9% of families spending a maximum of 1-3 hours outdoors with their children. The conclusion was that these parents preferred not to go out especially when recreational places are crowded and that they tended to stay out for only a short period of time.

The survey also aimed to find out about the parents' favorite places where they liked to spend their free time if given a chance. Results showed that 34.7% of them preferred beaches and near-sea places, 18.9% enjoyed city parks. 22% of the parents' explained their reasons for their choices as wanting to spend more time outdoors, 17% as a way to be more in touch with nature, and 15% simply as a way to lay back and relax.

The results caught by interviews with parents showed that 22.1% of disabled children were interested in touching the animals; 18.1% of them got impressed by birds, 12.3% were affected by the sounds of nature including water, and 43% were excited by flowers and fruit trees.

Natural waters, flowers, plants, and animals are integral elements of the nature whose many positive effects on children are one reason why children are interested in and attracted to.

3.2. Results of Interview With Orthopedic Disabled Children

The study carried out by the Joseph Rovntre Foundation (2006) which focused on playground designs for children with disabilities reports that it is necessary to understand the children's preferences and needs.

In this light, children were asked about their outdoor activity preferences. These data were collected through individual interviews with children. Interviews were semi-structured and questions were posed to the child in a friendly atmosphere in order to collect more reliable data and not distress the child. Pictures of children performing certain activities in school gardens were shown to the children, whom then were asked to list their favorites in order of preference.

According to the results, disabled children's most preferred outdoors activities are, in order, exploring nature for 18.3%, painting and playing water games and sports for 16.99%, and some sort of gardening-related activity for 14.37%. The chi-squared test used to analyze the association between children's ages and their choices revealed no significant results; so in this case, there is no relation between children's preferences and their ages (Table 2).

Table 2. Children Preferences of Activities in the School Garden

Gardening	Painting	Sensory play with sand	Water play activities	Playing in playground	Discovering nature
Gardening increases the self-confidence in children with disabilities.	Painting develops the power of the mental perception	Sand develops creativity in children with disabilities.	Water has a relaxing and calming effects on children with disabilities.	Playgrounds improves children social skills.	Discovering nature increases the sense of responsibility
% 14.37	% 16.99	% 16.33	% 16.99	% 16.99	% 18.3

Results of Interviews With Teachers Of Dogan Chaglar Special Education School



10 teachers at the Dogan Chalar Special Education Middle School were interviewed by applying direct survey method. Conversation guidelines consisted of 2 parts; the first part inquired about a the subjects the teacher taught, their field of education and the level they taught. The second part focused on the conditions in which the children with disabilities received their education, and on the shortages and expectation. It turned out that the special education teachers came from fields as different as language, technology and design, science, fine arts, history and literature.

All of the teachers had educated at the university level. When asked about the possibility of utilizing the school garden, teachers all emphatically agreed on the importance of green spaces for the learning and health of children with disabilities; however, they also pointed out that their school's garden was out of use and inaccessible to children.

Another question the teachers were asked in the interview was whether they has noticed any special attention given to the garden and the green areas by children with disabilities. It was agreed upon that the school garden's being out of use rendered the question somewhat irrelevant but they all pointed out that natural elements such as plants and flowers outside the school building did draw the children's attention. Nonetheless, children, it was established, spent more time watching television and playing video games than they did being physically active outdoors. Like children without disabilities, they would like to play in green spaces and playgrounds and enjoy being in the nature by their families and friends; interestingly, such activities would help them feel good and socialize better. Many of the teachers believed nature was a useful learning aid, especially in the teaching of such areas as natural science, arts, craft, physical education and math. However, since the school garden is not in usable/working condition, it is difficult to use it for educational purposes. Teachers suggested the open green area outside the school which is in walking distance be planned for educational use. They also mentioned how an open space where the children's handcrafted goods could be exhibited and exchanged could be effective in promoting the children's self-esteem.

4. Discussion

The income of families chosen for this research was too low and the tremendous expenses related to their disabled children have put them under more stress and pressure. Disabled people are grossly over-represented among poor people. They experience levels of economic and social deprivation rarely encountered by other sections of the population (Barnes and Mercer, 1994). The financial resources required for social participation may be affected by the disability of a family member, with the average cost of raising a disabled child estimated to be around threefold that of a normal child (Dobson & Middleton, 1998; 8). The family's financial situation can thus be aggravated as a result of parenting a disabled child, particularly if out-family support for the child is under-resourced (Sharma, 2002;13).

In their study based in a Turkish province, Ergün and Ertem (2012) report that the most frequently reported problems mothers of disabled children faced were were sadness, anger and loneliness. Mash and Johnston (1990) conceptualize parental stress as involving behavioral affective and cognitive components. Different parents usually experience the heightened levels of stress resulted by the presence of a disabled child differently; in most cases, however, it is the mother who gives up her job or career to stay at home and take over most of the childcare responsibilities. Even when they do not resign, the mothers of disabled children have been reported to have more sick days and more absences from work which can be traced back to the extra care their disabled children require (Westbom, 1992; 83-85). In addition, parents from poor (possibly single-parent) families with jobs that have lower incomes and less flexibility experience even greater problems when there is a child who has significant disabilities and learning and behavioral disorders (Di Giulio et al., 2014; 5-10).

Low-income people are often confronted with difficult social and environmental barriers to physical activity and have limited resources to overcome them. The most common of such barriers include lack of effective public transportation and poor access to parks and recreational facilities. While many of these barriers also exist in the case of families from other income groups, they tend to have graver repercussions in low-income communities. Transportation problems is the most important single issue that impede low-income families from making a routine of such activities as walking and biking.

Therefore, low income can be one of the main reasons for families with disabled children not to take advantage of parks and playgrounds. Consequently, school gardens, might be many disabled children's only chance to be able to enjoy and connect with nature. This type of gardens, thus, should be carefully designed to accommodate for the needs of children with a range of disabilities, needs which go unmet due to the children's



parents' financial problems. The analysis of the survey showed that 79.3% of students have used a wheelchair, which imposes certain restrictions of measurements on the design of a school garden.

All pathways should be at least 800mm wide so to be readily accessible to people in wheelchairs and to safely rule out the danger of sliding off. In order to make the paths as level as possible – the gradient should never be greater than 1:20 (i.e., for every 1.2 meters, the path must rise no higher than 10 cm from the ground). Sloped pathways will be more problematic in the rain; thus, if the pathway is on a slope, an adequate drainage system becomes a necessity. When designing the paths, it is imperative to avoid sharp turns and right angles on the one hand, and to make sure the connections sufficiently connect any two areas of the garden. Its important to prepare containers that would allow wheelchair users to reach for and easily access any existing gardening tools. The overall scheme and layout must make all parts of the garden easily accessible to wheelchair users. The garden should contain a secluded and shaded area with enough space for both the wheelchair user and others to sit and enjoy the garden (American Society of Landscape Architects Foundation, 1975; 10-45).

The results of the survey with the parents revealed that these families are disturbed by the negative attitudes of the surrounding people, itself a huge obstacle keeping them from going to public places. The attitude of the public affect both the material and non-material aspects of an individual's living standards, which is especially the case with disabled people. The findings of the report (2014) show that a large portion of the population held negative views disabled people, underpinned by a general lack of understanding about disability in general and disabled people's needs (Hardeep and McCarthy, 2014; 12-34). This is yet another factor aggravating the isolation families with disabled children. Ironically, this is not an issue while these children are in school, another incentive to take advantage of a school garden and related facilities.

It was found that parents preferred weekdays for spending time in a green space. One conclusion can be that these parents tend to avoid going in public when it's more crowded, such as weekends. With weekdays being also school days, this becomes more of a problem and another reasons to take advantage of school gardens. The survey with parents showed that disabled children are specially interested in elements of nature such as animals, birds, natural sounds, water, flowers, fruit trees; they all expressed a desire to touch such elements. For children with disabilities, that companionship can also include invaluable physical and emotional therapy. This bond is what motivates the positive outcomes achieved via Animal-Assisted Therapy. Children tend to be enthusiastic about working with animals, allowing Animal-Assisted Therapy to be used in a variety of settings with children suffering from a vast range of clinical concerns, including Autism, Emotional/Behavioral Disorders, and low levels of self-esteem (Alison, 2013; 3-20).

Teachers were asked during the interviews whether or not disabled children paid any attention to gardens and green areas. The response was that even though the school garden was out of use, animals and natural elements such as plants and flowers outside the school still drew children's attention. Nevertheless children spend more time viewing television and playing video games than they do being physically active outside. They said that this children in school time can not use school garden but animals and natural elements such as plants and flower in outside of school to draw children's attention. Many of the teachers believed nature was a useful learning aid, especially in the teaching of such areas as natural science, arts, craft, physical education and math. However, since the school garden is not in usable/working condition, it is difficult to use it for educational purposes. One way to create such a learning environment is to choose plants that are fast growing, able to provide shade and offer sensory exploration through color, texture and scent.

The plant composition must be carefully thought out so that it may be attractive and mysterious, with the capability for the children to hide; it must as well be suitable to harbor wildlife in the sensory garden. Fruit trees should also be planted in the garden because they have seasonal interest and some produce edible fruit (Hussein, 2010; 117-120).

School gardens, especially in special schools, have great benefits for both the teachers and the pupils as it provides a two-way learning process (Hussein, 2011; 349-350). For example, features found in the school setting encourage a greater understanding of and exploration by the users, affording easy way-finding and generating self-stimulating activities to bring back memories of home while enhancing learning opportunities outdoors. Thus, the children recognize the functional properties of their outdoor environment. Positive interactions are guaranteed between children playing in such educational settings. That is, playing involves perceptual learning and physical actions. During play, a child will 'pick up', gather and process the information through direct perception while moving in the setting.



Children like to explore nature more than adults do, a claim that is backed by the existing literature. They want to spend more time with natural objects (water, sand, flower, tree,..). The nature is a playground and a place of discovery for children. It is a place for adventure, exploration and imagination. Children incorporate all their senses when immersed in an act of exploration of nature. It is the place where they build their sense of wonder and connection with the environment. Frequent, informal experiences in nature can help develop life-long awareness and sensitivity to the environment. For these children, time spent in natural settings can offer relief from their symptoms and an environment that helps them to think differently as they begin to craft new strategies for coping with their disabilities.

The results of the present research showed that public playground facilities are not enough to accommodate children with special needs. Modern facilities in public parks are not appropriate. The findings of this study highly encourage governmental bodies to take the necessary steps for the planning and building of well-equipped public parks which accommodate the needs of children with disability. It also stated that government decisions regarding disabled children should be informed by detailed analysis of their special needs in the playground. It was found that the many problems families with disabled children face in large cities like Ankara deprive these children of enjoying natural settings, playgrounds and parks. These children spend the bigger portion of their life at school. Optimally-designed school gardens for children with disability can be a safe space where they can play and be in contact with nature while their learning skills are also positively affected.

It is highly important that children with disabilities have an accessible school garden around where they can play, explore, and learn. Earlier studies had shown that creating school grounds with sensory stimulation can amplify spiritual advancement, health improvements, emotional enhancement and social integration, in addition to this, augmenting the learning stimulation of the students, especially when being in contact with animals and plants.

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