

## THE IMPACT OF THE MULTI-SENSORY GARDENS DESIGN ON THE BEHAVIOR OF CHILDREN WITH HEALTHCARE NEEDS

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### ABSTRACT

Remarkably, the general development programs don't take into account the disabled children requirements or participation and they are unable to make their future decisions. A multi-sensory garden is a self-contained region that concentrates an extensive variety of sensory experiences. Such a region, if designed well, gives a valuable asset for a wide range of users, from education to recreation. It is distinct since all these components, but have to be carefully chosen and designed to appeal to the senses in such a way that they give maximum sensory stimulation. This paper focuses on the effect of multi-sensory gardens design on different aspects and their effects on disabled children, and grasp the influence of the physical environment on children and recognize environmental qualities that are linked with particular behavioral reactions. It's investigating by observing the regions and how they are utilized by disabled children. The methodology implanted here is based on observation, surveys, which were used in conjunction with theoretical theories. Finally, concluding the important role in increasing the communication between disabled children and nature, improving cognitive performance and promoting psychological recovery.

**KEYWORDS:** Sensory gardens, Nature, Spatial Perception, Creativity, Cognitive.

### 1. INTRODUCTION

The use of sensory gardens in treatment contains a long history. The concepts of healing gardens derived back to the religious and medical residence gardens which back to middle age. Nowadays, scientific proof has revealed that natural environments will forestall, treat and rehabilitate children from stress-related diseases. For a period

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of time, the health effects of staying in natural landscapes and outdoor parks are joined to sunlight, fresh air, and physical activity. Such theories are still current [1].

Today, scholars additionally discuss with many different theories, wherever the foremost referred theories are Attention Restoration Theory (ART), and also the Psycho-Evolutionary theories [2]. Medicine studies show that staying in natural environments, like in nature-based and horticultural therapy, have a major and positive impact on the recovery of each perceptual abilities and levels of stress [3]. Qualitative studies and several in-depth review articles [4] show that profound existential problems are being processed by the participants, for instance, may impact their health and well-being within a positive direction. Many mechanisms appear to be involved.

## **2. SENSORY ENVIRONMENT**

The concept of sensory gardens should appeal to any or all five senses to provide therapeutic expertise for disabled children [5]. It'll be in physical, psychological and sociological forms. A multi-sensory outdoor landscape environment could be a dedicated public space or room, wherever stimulation is controlled, manipulated, intensified, reduced, bestowed in isolation or combination, packaged for active or passive interaction and temporally matched to suit the perceived motivation, interests, leisure, relaxation, therapeutic and /or academic needs of the user [6].

## **3. THE RELATIONSHIP BETWEEN PHYSICAL AND SOCIAL ENVIRONMENT AND HUMAN'S FUNCTIONS**

The Child's Mental Power Earlier studies of however children perform in parks and gardens are found that experiences of nature have an effect on children differently, mostly depending upon their life situation [7]. A children's experience of nature can depend upon how much they're ready to absorb from the outdoors and the way robust their mental power [8].

There are four levels of mental powers; the first level is "directed inward involvement" wherever one needs to be alone by himself, the mental power is low and also the activities tend to be personal. By increasing the level of mental energy the

children might tend to be more active, the second level is “emotional participation” by having visual contact with others, the subsequent stage is that the “active participation” level wherever one tends to be active with the group of children. They might prefer to share and be inventive, the “outgoing involvement” level, wherever the mental energy is extremely robust, they’re robust enough to do things even with no need the support from outside [8].

#### **4. NATURE, HUMAN AND ITS RELATION WITH PERCEPTION**

Rachel and Stephen Kaplan have studied people’s perception of the natural environment. They have introduced nature as “places where plants grow” not “those far away, vast and pristine place rather parks, open spaces, meadows, backyard gardens”. Water, paths, light, accessibility, and direction were salient findings once selecting most popular views [9].

Our long historic relationship with the planet has apparently left us with deeply seeded preferences for natural settings. These connected ideas led Kaplan’s to outline and predict nature preference; they postulated that humans would like understanding and exploration in their environment. Informational factors that satisfy these wants are coherence and legibility to foster understanding as well as complexity and mystery to help exploration [10]. These factors may be used to predict the characteristics of natural areas that will give positive or therapeutic benefits to the observer [11].

#### **5. ATTENTION RESTORATION THEORY (ART)**

Kaplan’s studies examine the method in which this restorative impact of preferred nature is achieved and what properties make it potential. We tend to look for restoration when mental fatigue sets in as a result of worry, anxiety or intense mental effort or prolonged attention to task [12], thus leading to “fatigue of directed attention”.

It synthesized these experiences to advance four elements that might satisfy the necessity to interact involuntary attention and permit mental capacities to be recharged and therefore restore children to a healthy baseline state [13], “Being Away” as an

escape from the ordinary distractions, getting far away from the details requiring deep concentration or mental escape from either of the above, or “Extent” as escape involving being in a whole alternative world. The expertise should be complete enough to become immersed as in suspending reality like the experience whereas reading a book, visiting the theatre or visiting ‘Disney World’ nevertheless still remaining connected to the globe as a whole. “Fascination” as the trigger stimulus captures the involuntary attention, as bright, shiny, moving or wild things also like learning, puzzles or sequencing information into a larger connected pattern. Finally, “Compatibility” as the ability to function within the environment as one would expect [12].

## **6. HUMAN ENVIRONMENTAL VALUE THEORY**

Kellert's focuses on understanding the link between human and natural systems with an interest within the value and conservation of nature as methods to harmonize the natural and built environments. He has clarified basic values in which meaning and benefit are derived from biophilic theory. They supply a conceptual framework for the universal expression of human affinity for nature and also the link between physical and mental benefits provided naturally [14].

So the theoretical values in nature is; the aesthetic value which physical appeal of an attraction to nature, humanistic value is emotional attachment to nature, moralistic value is moral and spiritual relation to nature, naturalistic value is a direct contact with an experience of nature, symbolic value is nature as a source of metaphorical and communicative thought, and utilitarian value is nature as a source of physical and material benefit [15].

## **7. METHODOLOGY**

The methodology implemented in this study is divided into main three phases. Firstly, introduce different theories were explored and analyzed through a conductive literature review and their various elements were categorized into; design aspects and psychological aspects. Secondly, these aspects were assessed through a questionnaire

introduced to architects for defining their importance of relative weights in the design process, then applied these aspects on an international case study. Finally, using the SPSS to identify the effect of the design aspects on psychological recovery.

## 8. FIRST PHASE: THEORETICAL ANALYSIS AND QUESTIONNAIRE

This part will present the main two aspects; design and psychological, that were conducted from the above analysis of the literature review.

The questionnaire focuses on the Likert scale which is conducted to identify the impact of the design process for multi-sensory garden on a psychological recovery of children as shown in Appendix A. There are 74 questionnaires' copies were distributed equally to architects (site engineers, academic staff, and students), including 30 female and 44 male by formulating a set of questions that determining the effectiveness of the multi-sensory garden for psychological state and supporting the social relations of the children. Also, there were other questions evaluating the design process. The research conducted from the theoretical studies and questionnaire the criteria which should take into account in the design process as shown in the following Tables 1-2.

Table 1. Design Aspects from a literature review.

Principles of a Healing Garden	The feeling of security (body, employment, resources, the family, health, property)	Principles of Multi-sensory garden	Access and usability
	Movement, rhythm, and exercise		Comfort
	Activities		Sensory experience (Touch, Sound, Sight, Smell, Taste)
	Social Support (Among Patients, Visitors, and Staff)		Sight (color, Pattern, and shape, Movement, Visual contrast)
A natural or designed setting which satisfies the children needs	Coherence Legibility Complexity Mystery Continuity	Human environmental value	Mood and ambiance
			Aesthetic Value
			Humanistic Value
			Moralistic Value
			Naturalistic Value
			Symbolic Value
			Utilitarian Value

In Table 1 the Design aspects which involve the principles of a healing garden, principles of a multi-sensory garden, a natural or designed setting which satisfies the children needs, and Human environmental value.

Table 2. Psychological Aspects from a literature review.

The factors of Creativity	Defying oneself (Self-challenge)	Behaviors which leading to self-actualization	Trying new things
	Challenge the society		
	Challenge the Zeitgeist		
	seeking perfection		
	Being relaxed, free, joyful, playful	Behaviors which leading to self-actualization	Listening to your own feelings
	Acceptance of disorder		
	Filled with positive emotion		
	The electromagnetic fields which surround our bodies emitted from every line shape, pattern, color, material, Orientation, balance, and direction		
Involvement depending on the individual's Mental power	Self-initiated learning	Transformation of Direct Attention to involuntary attention	Responsibility and working hard
	Self-explore methods		
	Directed inward involvement		
	Emotional participation		
	Active participation		
	Outgoing involvement		
			Being Away
			Extent
			Fascination
			Compatibility

In Table 2 the psychological aspects which involve the creativity, behaviors which leading to self-actualization, Levels of involvement depending on the individual's mental power, and how transforming of direct attention to involuntary attention that stimulate the senses of disabled children.

## 9. SECOND PHASE: ANALYTICAL STUDY

The Lerner of the Five Senses Garden is one amongst coastal Maine botanical gardens, and it's nestled in Boothbay, Maine, which is the most important public garden within the United States. Once the gardener and also the most active members were suddenly struck blind cause of a health problem, the directors of CMBG decided to design the Lerner of the five senses garden to appeal all senses and allowing the blind and others with special needs to relish [16].

The five sensory zones are shown in the layout of the garden in Fig. 1, which clarify the different nooks and aspects which surround the main path to stimulate the

five senses through using many aspects; this research scope on the design aspects to identify the impact of the them on the recovery of children, which derived for three main aspects;

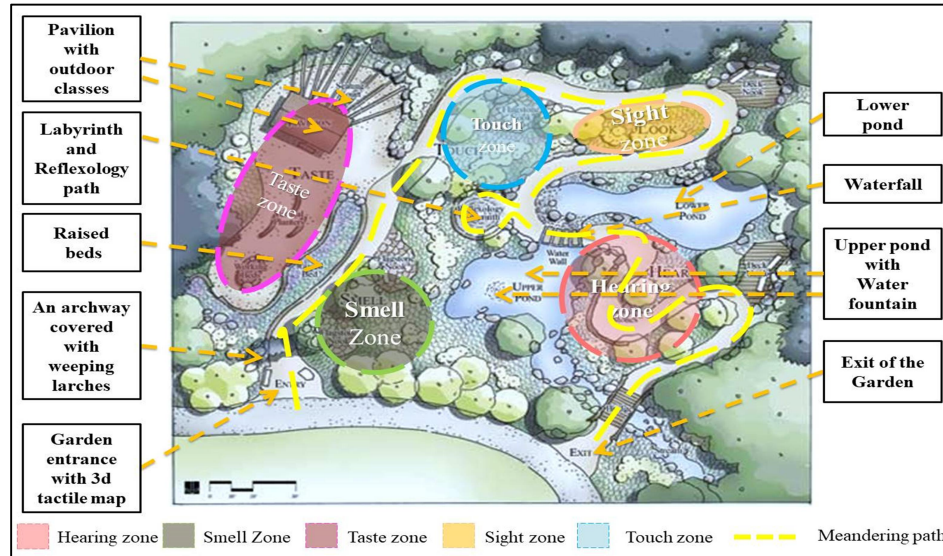


Fig. 1. Layout of the Lerner Garden.

Firstly; the principles of sensory garden are achieved through several aspects, like access and usability that is through a striker stones border that outlines the path and offers navigating blind children, also the level of the pathway is especially appropriate for children of wheeled mobility to see at the upper surface of the lake, and well, the whole Lerner Garden. Then the comfort aspect, in every space there are benches with backs and armrests [17], the raised beds have handrails and wheelchair niches, nodes for seating in every section with changing in the tactile pavement and clear visual entry signs.

Subsequently, sensory experience; firstly, sense of hearing, as shown in Fig. 2, there are nestled hollowed sound stones at different heights, also as shown in Fig. 3 providing an auditory orientation for blind children through the sound of water from the central fountain and waterfall. Secondly; the experience of plantations smell that within flowers and herbs with pleasant fragrances and aromas [16], also the interactive taste zone as shown in Fig. 4, with groups of waist-high garden beds appropriate for seating or standing children, contains edible vegetables and herbs, that's to stimulate

the experience of taste, also there are in the garden the fresh produce to taste. For stimulating the sense of sight, there is a clear visual foliage texture and color distinction, and the interesting spatial quality created by the grade change and use of terrain, also the upper pond has a small fountain as shown in Fig. 3 to make an orientation aspect for visual and audible sides, and eye appeal creating through a multitude of colorful plants in a wide variety of colors, sizes and shapes [17].

Secondly, analyze of the natural or designed setting that satisfies the children requirements as coherence aspect as shown in Fig. 1 which achieved through the central water feature, the spatial organizer and therefore the looping meandering path that joins between the zones, also using of the terrain and therefore the meandering track system [16]. Furthermore, legibility features consisting of large font signage marks for the plantings and multitude of sculptural components, a welcomed and introduced plaques within the garden. Achieving the mystery aspect as shown in Fig. 5, a labyrinth in the tactile space built from the raised lake stones, children should take off their socks and shoes, and have a walk, it's designed as a reflexology path for becoming more imaginative [17]. Lastly, as shown in Fig. 5, a continuity aspect that is clarified in the labyrinth stones that gradually become tinier towards the center, which creates different sensations for the blind children.



Fig 2. The hollowed sound stones in different heights [16].



Fig. 3. Central water fountain in the upper pond [18, 19].



Fig. 4. Raised beds [18].



Fig. 5. A labyrinth and a Reflexology path [16].

Eventually, evaluate the relationship between Man and nature which achieved in four features as well as, at first, as shown in Fig. 6, the aesthetic value that involving a sense of security as the entrance to the garden is through an archway covered with



weeping larches and colorful, paved paths, plantings and fragrant vines, also as shown in Figs. 1-7, creating an indoor-outdoor classrooms for more interaction between children as well as imposing pavilion and fan-shaped pergola [16], also an upper lake water fountain acts as a centralized landmark. It's nestled off-center for waves creating that flow into the lower lake through a series of parallel channels through a dam at an angle of forty-five degrees. Secondly, achieve of naturalistic value which through a stream come from beneath a walkable bridge above the upper lake which built from two native trees, it's considered one among several environmentally sustainable features [17], achieved through "Fascination" way, it leads to a dozen other ornamental gardens and paths and through forests filled with majestic ledges, wildflowers and ferns, also achieved by "Compatibility," which offers a wide variety of sequential views, nooks and points of view. Then the moralistic value achieved through the preservation of existing trees which combine the garden with its surroundings and the using of natural stone walls and rocks [16]. Then, the achievement of utilitarian value as shown in Fig. 8, which achieves through using in the doorway arch there's a 3D bronze braille and tactile garden map [17], the handrail of the bridge that's made from a locally harvested, and sculptured for the tactile expertise, permeable paving, use of suitable plants and native materials and craftsmen, also as show in Fig. 9, the "cracked-ice" paving in these areas helps distinguish them from the walk [16].



Fig. 6. Colorful plantings, paved paths [16].



Fig. 7. Outdoor classroom [16].



Fig. 8. 3D tactile Map [17].



Fig. 9. The gateway of the garden [17].

## 10. THIRD PHASE: THE SPSS STATISTICS ANALYSIS

This paper has independent variables as design aspects and dependent as well as psychological aspects, so the research will proceed through three tests to help in recovery through a multi-sensory garden for disabled children;

### 10.1 First Test

The factor analysis of the variables for designing of Multi-sensory gardens, so the results of this test are reducing the Psychological aspects from 21 to become 19 elements, in contrast, the design aspects don't minimize.

This test aims to find out the common psychological settings that are likely to be common to all multi-sensory gardens and examine the design aspects undertaken by, and the intentions of, the designers and the constraints that they had to deal with in accomplishing a well-designed multi-sensory garden that would fulfill children's needs.

### 10.2 The Second Test

Using the correlation test to determine the value of Pearson correlation in each relationship, as shown in Table 3, there is a correlation between the psychological aspects in rows and design aspects in columns.

Table 3. The correlation between psychological and design aspects.

	Feeling of security	Movement, rhythm and exercise	Activities	Social Support	Access and usability	Comfort	Sensory experience ***	Sight ****	Mood and ambience	Coherence	Legibility	Complexity	Mystery	Continuity	Aesthetic Value	Humanistic Value	Moralistic Value	Naturalistic Value	Symbolic Value	Utilitarian Value
Defying oneself *	.2	0	.2	0	.1	.2	.3	.4	.4	.2	.2	0	.1	.1	.2	.1	.2	.1	.2	.3
Challenge the society	.2	.1	.3	.2	.1	.2	.3	.1	.2	.2	.2	.1	-.1	.3	.2	.1	.3	.2	.4	.2

Table 4. The correlation between psychological and design aspects (Cont.).

Challenge the Zeitgeist	.4	.2	.3	.3	.3	.3	.3	.4	.2	.4	.5	.2	.2	.4	.3	.1	.3	.4	.3	.2
Relaxed, joyful, playful	.4	.2	.6	.2	.4	.6	.4	.6	.5	.2	.2	0	.1	.2	.3	.3	.3	.2	.1	.2
Acceptance of disorder	.2	-.1	.1	.3	.1	.2	.3	.3	.4	.2	.1	.1	.2	.2	.1	.3	.2	0	.2	.1
Positive emotion	.7	.3	.7	.4	.6	.6	.6	.6	.5	.3	.4	.2	.1	.1	.4	.3	.3	.4	.3	.4
Electro-magnetic**	.4	.2	.5	.5	.4	.3	.4	.3	.3	.5	.4	.3	.1	.2	.4	.2	.2	.3	.3	.2
Self-initiated learning	.4	.2	.4	.2	.3	.4	.5	.4	.4	.2	.3	.2	.1	.2	.3	.3	.3	.2	.3	.3
Self-explore methods	.5	.3	.4	.2	.3	.4	.5	.5	.5	.2	.4	.1	.1	.3	.2	.3	.3	.3	.3	.5
Trying new things	.2	.1	.3	.4	.2	.3	.5	.3	.2	.1	.2	.2	0	.1	.2	.1	.2	.1	.3	0
Own feelings	.3	-.1	.1	.1	.1	.3	.2	.2	.1	0	.1	.4	.2	0	-.1	.2	.1	0	.2	.2
Directed inward involvement	.1	-.1	.1	.3	.3	.2	.1	0	.2	-.1	-.1	.1	-.2	-.1	.1	.2	.2	0	0	0
Emotional participation	.3	.3	.2	.3	.3	.2	.2	.3	.2	.1	.3	-.1	.1	.1	.1	.2	.2	.2	0	.1
Active participation	.3	.3	.6	0	.2	.3	.4	.5	.5	.3	.3	.1	-.1	.2	.4	.2	.3	.2	.2	.4
Outgoing involvement	.5	.3	.5	.2	.2	.4	.4	.4	.4	.4	.3	.2	.2	.2	.3	.1	.1	.2	.3	.3
Being Away	.3	0	.2	0	.1	.2	.2	.2	.1	.3	.3	.1	0	.2	.3	.3	.3	.1	.3	.3
Extent	.5	.3	.6	.2	.4	.4	.3	.4	.3	.5	.5	.2	.3	.4	.4	.3	.4	.2	.3	.3
Fascination	.5	.4	.6	.4	.3	.5	.4	.5	.4	.7	.5	.3	.4	.4	.4	.3	.4	.4	.5	.3
Compatibility	.5	.4	.6	.2	.4	.5	.5	.5	.4	.6	.4	.1	0	.5	.5	.4	.5	.5	.4	.4

\*\* (Self-challenge), \* The electromagnetic fields which surround our bodies emitted from every line shape, pattern, color, material, Orientation, balance, and direction, \*\*\* Sensory experience (Touch, Sound, Sight, Smell, Taste), \*\*\*\*Sight (color, Pattern, and shape, Movement, Visual contrast)

The correlation test gives the relation between design and psychological variables that will integrate green areas which will allow an enhanced sensory experience, and make a more sustainable and inclusive approach for disabled children.

### 10.3 Third Test

Using the Regression test, its result a regression equation models as shown in Eq. (1) in Table 4, between the independent and dependent variables. It can predict design aspects from the psychological aspects, specifically how the psychological variable typically acts when one of the design variables is changed.

Table 5. The linear regression test between the design aspects and psychological aspects.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.856	6.200		3.912	0.000
	Psychological Aspects	0.939	0.084	0.795	11.133	0.000

$$\text{Design Aspects} = 0.939 \text{ Psychological Aspects} + 11.856 \quad (1)$$

The above equation gives a relation between the design aspects and psychological aspects that will encourage sensory stimulation, physical mobility and social skills as well as health improvements, environmental education, emotional growth and mental development.

## 11. CONCLUSION

This paper from the previous tests for the psychological aspects concludes that: firstly; ‘defying oneself (self-challenge)’ and ‘challenge the society’ have an effect in the levels of a transformation of direct attention to involuntary attention. Secondly; ‘challenge the zeitgeist’ has an effect on self-actualization and the levels of a

transformation of direct attention to involuntary attention. Thirdly; 'being relaxed, free, joyful, playful' and 'filled with positive emotion', 'the electromagnetic fields', and 'outgoing involvement' have an effect on creativity and self-actualization. Fourthly; 'self-initiated learning' has an effect on creativity and type of involvement depending on the individual's mental power. Fifthly; 'self-explore methods', 'emotional participation' and 'active participation' have an effect on creativity. Then; the 'acceptance of disorder', 'trying new things', 'listening to your own feelings' and 'directed inward involvement' have an effect on type of involvement depending on individual's mental power, and finally; 'being away', 'extent', 'fascination' and 'compatibility' have an effect on self-actualization.

Also, conclude from the previous tests for the design aspects are; at first; 'feeling of security', 'movement, rhythm and exercise', 'access and usability', 'comfort', 'sensory experience', 'sight' have an effect on principles of healing gardens. Secondly; 'activities' has an effect on principles of healing gardens and principles of multi-sensory gardens. Thirdly; 'social support' has an effect on principles of healing gardens and human environmental value theory. Fourthly; 'mood and ambiance' have opposite effects between principles of healing gardens and human environmental value theory. Fifthly; 'coherence' has an effect on principles of multi-sensory gardens and a natural or designed setting to satisfy the children needs. Then; 'legibility' has an effect on principles of healing gardens, principles of multi-sensory gardens and a natural or designed setting to satisfy the children needs. Furthermore; 'complexity' has an effect on a natural or designed setting to satisfy the children needs and human environmental value theory. Also; 'mystery' and 'continuity' has an effect on a natural or designed setting to satisfy the children need. The 'aesthetic value', 'humanistic value', 'moralistic value', 'naturalistic value', and 'utilitarian value' have an effect on principles of multi-sensory gardens. Eventually; 'symbolic value' has an effect on a natural or designed setting to satisfy the children needs.

From the correlation test; there is a strong effect between design and psychological variables except the 'mystery' and 'continuity'. Thus; this paper conclude from the previous tests and Regression test the preceding equation Eq. (1) to

clarify the relationship between the design aspects and the psychological aspects for enhancing the design process for multi-sensory gardens for disabled children.

All the previous results reflect on the aim of this research which is achieving an innovative scheme for rehabilitation disabled children to integrated and supported living, which will be unique in our community and will provide a sustainable environment to benefit the whole community, also to achieve a psychological framework for landscape design of multi-sensory gardens for health reasons which are still one of the main subjects which needed in Egypt and the world, also reflect on the hypothesis of this research which if we get a psychological framework for the better landscape design of a multi-sensory garden then it'll improve the psychology of children and integrate them in a community, also it'll help in sustainable development in Egypt.

#### **DECLARATION OF CONFLICT OF INTERESTS**

The authors have declared no conflict of interests.

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## APPENDIX

Interview questionnaire for the architects

It's containing about eight pages, involving questions about the psychological aspects and design aspects, and there are 2 pages of the questionnaire as shown in Fig. 10.

1. What is the importance of the involvement levels according to an individual's mental power in the design process?

2. What is the importance of the factors of a natural or designed setting which satisfy the children needs in the design process?
3. What is the importance of the levels of transformation of Direct Attention to involuntary attention in the design process?
4. What is the importance of principles of a Healing garden?
5. What is the importance of principles of Multi-sensory garden?
6. What is the importance of the values in Nature?

1= the least importance, 2 = less importance, 3= medium importance, 4 = more importance, 5 = The Most importance.

**What is the importance of principles of Multi-sensory garden?**

**Access and usability**

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

**Comfort**

Seats, shelters from sun, access to toilets and changing facilities is a critical issue.

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

**Sensory experience (Touch, Sound, Smell, Taste)**

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

**Sight (Color, Pattern and Shape, Movement, Visual contrast)**

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

**What is the importance of the levels of transformation of Direct Attention to involuntary attention in the design process?**

**'Being Away'**

Getting away from the details requiring deep concentration.

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

**'Extent'**

Escape involving in a whole other world, reading a book, visiting the theatre or an extreme example such as a trip to 'Disney World'

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

**'Fascination'**

The trigger stimulus that captures the involuntary attention, bright, shiny, moving or wild things as well as learning puzzles.

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

**'Compatibility'**

The ability to function in the environment as one would expect.

1 2 3 4 5

The Least ☐ ☐ ☐ ☐ ☐ The Most

Fig. 10. There are two pages of the questionnaire.



### تأثير تصميم الحدائق متعددة الحواس على الأطفال ذوي الاحتياجات الخاصة

من اللافت للنظر أن برامج التنمية العامة لا تأخذ في الاعتبار احتياجات الأطفال ذوي الاحتياجات الخاصة أو مشاركتهم، فهم لا يحصلون إلا على القليل من الخدمات المقدمة للمواطنين الآخرين، ولا يستطيعون اتخاذ القرارات المتعلقة بمستقبلهم. تعتبر الحديقة متعددة الحواس منطقة قائمة بذاتها، حيث تركز على مجموعة واسعة من التجارب الحسية، كما أنها تعطي قيم تعليمية وترفيهية كبيرة لمجموعة واسعة من المستخدمين، ولكن يجب أن يتم تصميمها بعناية لتتناسب مع الحواس بطريقة تعطي أقصى قدر من التحفيز الحسي، تركز هذه الورقة على تأثير تصميم الحدائق متعددة الحواس على الجوانب المختلفة وتأثيراتها على الأطفال ذوي الاحتياجات الخاصة، وفهم تأثير البيئة المادية على الأطفال والتعرف على الصفات البيئية المرتبطة بتفاعلات سلوكية معينة، ويتحقق ذلك من خلال مراقبة الحدائق متعددة الحواس وكيفية استخدامها من قبل الأطفال ذوي الاحتياجات الخاصة. تعتمد منهجية الورقة على الملاحظة، والمسوحات، التي استخدمت مع النظريات، أيضا استنتاج الدور المهم في زيادة التواصل بين الأطفال ذوي الاحتياجات الخاصة والطبيعة، وتحسين الأداء المعرفي وتعزيز العلاج النفسي.