

AicE-Bs 2010 Kuching

Asia Pacific International Conference on Environment-Behaviour Studies, Grand
Margherita Hotel, Kuching, Sarawak, Malaysia, 7-9 December 2010

The Influence of Sensory Gardens on the Behaviour of Children with Special Educational Needs

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Abstract

This study explores the use of sensory gardens by observing the zones and how they are utilised, by children with special educational needs. Methods applied were interviews, observation and behaviour mapping, which was used in conjunction with affordance theory. Affordance were categorised by landscape furniture, soft and hard landscape in relation to three categories of activities: Sensory stimulation, physical and social skills. The findings discovered continuous pathways that link the sensory garden to the site context, with easy access to the features, have the highest number of users. Another finding found that users spent a longer time in zones where sensory, rather than aesthetic value, were emphasised.

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Keywords: Accessibility; affordance; behaviour; sensory

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1. Introduction

1.1. *What is a sensory garden?*

A sensory garden is a 'self-contained area that concentrates a wide range of sensory experiences. Such an area, if designed well, provides a valuable resource for a wide range of users, from education to recreation' (Sensory Trust, 2009). Shoemaker (2002:195) stated that a 'sensory garden cannot be designed without considering the human element. Unlike traditional display gardens that are meant to be observed from a distance, sensory gardens draw the visitor into touch, smell and actively experience the garden with all senses'. What makes a sensory garden different from any other garden? 'The only difference in a sensory garden is that all these components, (hard and soft landscaping, colours, textures and wildlife), must be carefully chosen and designed to appeal to the senses in such a way that they provide maximum sensory stimulation.' (Lambe, 1995:114)

1.2. *Historical background of sensory gardens*

In an interview that the researcher conducted with Jane Stoneham (August 9th, 2006), the director of the Sensory Trust and the author of the book, 'Landscape Design for Elderly and Disabled People', Stoneham stated that the initial idea of sensory gardens was derived from the horticultural therapy movement, which developed in the United Kingdom in the 1970s. Horticultural therapy was focused on special environments, i.e. hospitals and rehabilitation units and, as a result, developed more rapidly than sensory gardens. One positive aspect of sensory gardens was the genuine response to meet the needs of visually-impaired people. Stoneham added, however, there was not really much thought given to the design of these gardens. The first sensory gardens were often located in public parks because the local authority decided that it was a way of showing that they were implementing inclusion strategies. However, the reality was that they were small areas, often signposted as 'Garden for the Blind', and they consisted of a combination of scented plants, Braille labels and raised planters. Over time, society's attitude to disability changed, as did the function and users of the sensory garden. Any design for disabled people should aim to help overcome the stigma that is attached to being labelled 'disabled'. Since the mid-1970s, society has suggested that this can be achieved more easily by integrating, rather than segregating facilities. In 1978, the then United Kingdom Minister for the Disabled, Alfred Morris said, 'The simplest way of causing a riot in any locality in Britain would be to clamp on the able-bodied the same restrictions that now apply to the disabled. They feel that their personal handicaps are bad enough without the gratuitous social handicap of being treated differently from everyone else' (Rowson, 1985:21). Stoneham (2006) added that in the 1980s, visually-impaired people challenged the initial ideas about 'gardens for the blind' because the issue of being segregated from able-bodied people was itself beginning to be challenged. It is now widely understood that disabled people do not want to be segregated from able-bodied people in their enjoyment of green areas. The idea is to integrate green areas that allow an enhanced sensory experience, which will make for a sustainable and inclusive approach rather than making 'special' provision for disabled people (O'Connell and Spurgeon, 1996).

2. Literature Review

2.1. *What are 'special educational needs'?*

The term 'special educational needs' covers an array of difficulties as highlighted in the 2001 Special Educational Needs Code of Practice, which 'recognises a wide spectrum of special educational needs that

are frequently interrelated, although there are also specific needs that usually relate directly to particular types of impairment' (Department for Education and Skills, 2001:85, para.7.52). The Pupil Level Annual Schools Census data was amended in 2004 to include 12 categories of special educational needs: Specific learning disability, moderate learning disability, severe learning disability, profound and multiple learning disability, emotional and behavioural difficulty, speech, language and communication needs, hearing-impaired, visual impairment, multi-sensory impairment, physical difficulty, autism spectrum disorder and others. Most of the sensory gardens visited during the preliminary site studies (from which in this paper, one of two was selected as case study is the Lyndale Special School in Liverpool, United Kingdom), provided access to children with at least one or more special educational needs, as per the 12 categories listed above. In this study, the term 'special educational needs' will be used when describing the students using the case study sensory garden.

2.2. What is a multi-sensory environment?

A multi-sensory environment is a 'dedicated space or room... where stimulation can be controlled, manipulated, intensified, reduced, presented in isolation or combination, packaged for active or passive interaction and temporally matched to fit the perceived motivation, interests, leisure, relaxation, therapeutic and /or educational needs of the user' (Pagliano, 1998:107). Pagliano (1999:14) added, 'the multi-sensory environment literature can be divided into four themes, each describing a particular type of multi-sensory environment. The first multi-sensory environment closely follows the original 'Snoezelen Philosophy which was created for leisure and recreation in favour of disabled people. The second theme has been developed principally for therapy, specifically designed for the treatment of some disorder or condition. The third theme has been principally created for education to promote learning and development. The fourth theme is multi-functional, in which space can be used for leisure and recreation, for therapy, education or any combination of the three'. Since the researcher selected school-based sensory gardens, this study considered the third theme, that of a multi-sensory environment which is created for educational use. In this study, the term 'multi-sensory' describes the multiple bodily senses, particularly to which students with special educational needs could be exposed, namely, to a stimulating environment that is designed to offer sensory stimulation using textures, colours, scents, sounds, etc. This type of environment provides an area for users to control, manipulate, intensify or reduce stimulation within a safe environment (Best, 1992) while relaxing, interacting and learning from one another (Glenn et al., 1996).

2.3. Outdoor education

Having an accessible school ground, is highly important for children to give them the opportunity for free play and choices for exploration and learning. Titman (1994:58) identified four elements that children looked for in school grounds: A place for doing (opportunities for physical activities); a place for thinking (opportunities for intellectual stimulation), a place for feeling (to provoke a sense of belonging) and a place for being (to allow them to be themselves). Her research focused on the value of improved school grounds as an educational resource to demonstrate how students' attitudes, behaviours and learning skills could be enriched. One of the ways in achieving an environmental education is to choose plants that are fast growing, able to provide shade, able to offer visual stimulation through their being colourful, textured and scented. Plant compositions must be carefully considered so that they provide mystery, have the ability to hide and to create space. One example of a school which has built this kind of environment is Meldreth Manor School in Hertfordshire (Frank, 1996; Stoneham, 1996). The sensory

garden there was designed with a series of ramps and raised pathways integrated and woven around the existing apple trees that offer pupils a variety of sensory experiences.

2.4. Educational benefits

Having a multi-sensory environment in special schools is beneficial for both teachers and pupils as it provides a two-way learning process. Building Bulletin 77 (1992:49) outlined, 'External spaces can provide opportunities for observation, investigation and problem-solving and form a flexible facility often more readily adaptable to change in user requirements than the building itself. They can offer a stimulating environment suited to practical activities from which many pupils with special needs can benefit'. This idea matches Titman's (1994), Lucas' (1996), Stoneham's (1997) and Moore's (1999) beliefs that outdoor environmental learning can give children a stimulating experience as well as influence their behaviour and their development in terms of social relationships. This notion has received further support from Barbara Dunne of the Royal School for the Deaf and Communication Disorders, Manchester: 'Pupils are most likely to succeed when they are involved in 'doing' activities rather than academic learning. Environmental education is an ideal activity learning medium' (Stoneham, 1996:8). The research findings of Rohde and Kendle (1994), Malone and Tranter (2003) and Maller and Townsend (2005/2006), have proven that providing school grounds with sensory stimulation can encourage mental development, health improvements, emotional growth and social integration, in addition to increasing the learning motivation of the pupil, especially being in contact with animals and plants. For children with autism, they may 'seek sensory stimulation from the environment in order to calm or self-regulate their nervous system' (Stadele and Malaney, 2001:213). Research conducted by Learning through Landscape also made apparent that teachers appreciate outdoor areas as a foundation for the education of children with special educational needs whom they can assist in reducing aggressive behaviour and bullying.

2.5. Disability

Mount and Cavet (1995) and Chawla and Heft (2002) mentioned the richness of the visual, auditory and tactile stimuli that gardens can offer and the opportunities they could offer for exploration and thus, how they could assist users to develop an understanding of the environment. However, any impairment, disability or handicap will limit a person's ability to engage with the environment. The principal of Farrer Huxley Associates, Noel Farrer (2008:17), mentioned that, 'When designing for children with disabilities, it's vital to understand that their senses are completely different. You are not dealing with the same sort of physicality, you are dealing with texture, smell and sound; motor skills are far more localised...' McLinden and McCall (2002:54) differentiated between the close senses (touch and taste), and the distance senses (sight, smell and hearing). They further noted that 'when the distance sense of vision is impaired, young children may be able to compensate to some extent by making greater use of their other distance sense – hearing'. For example, during the observation period at the case-study site, a teacher expressed her feeling that it was a pity that the water feature was not working because her visually-impaired student loved to hear the sound of the water and when he did, he would remain at the *Water Central Area* for a longer period. Best (1992:119), quoted by McLinden and McCall (2002:99), stated that 'when facial expression and tone of voice are too sophisticated (through learning difficulties) or inaccessible (through sensory impairments), then touch is the primary channel of communication for the children. Information and emotions will be conveyed through touch and so the adult will need to ensure that the intended message is being conveyed'. This is evident from the research findings at the case-study

site that the sense of touch has the highest sensory stimulation compared to other senses amongst the users of sensory garden.

2.6. *The concept of affordances*

‘A key of understanding the implications of the built environment and children’s active living is the concept of affordance.’ (Gibson and Pick, 2000, quoted in Cosco, 2007:127) It helps us to understand the impact of the physical environment on children and to identify environmental attributes that are associated with specific behavioural responses.’ (Gibson and Pick, 2000, quoted in Cosco, 2006:17) The approach can be understood through three concepts: Affordance, information and pickup information (Gibson and Pick, 2000).

2.6.1. *Affordance*

Affordance is defined as the functionally significant properties of physical opportunities and dangers, which an organism perceives while acting in a specific setting (Gibson, 1979/1986; Gibson and Pick, 2000; Heft, 2001; Kytta, 2003). In other words, the environment features as a property of the relationship between the environment and the users and the possibilities that a place can offer users, whether or not the designers intended those possibilities. Thus the concept of affordance, in Gibson’s ecological approach, has been applied to ‘examine the relationship between the functional properties of the environment and how environments are used’ (Clark and Uzzel, 2002:95).

2.6.2. *The levels of affordances*

According to Kytta (2003), children’s engagement with the environment can be divided into two levels of affordances: Actualised and potential. Actualised affordances are what the children encountered during their independent mobility, perception and engagement with the environmental features (Heft 1988, 1999; Kytta 2002, 2003, 2006). Potential affordances are different for each individual and each specific group of people, depending on how their physical skills or bodily proportions, social needs and personal intentions are matched with the environmental features (Kytta, 2002, 2003, 2006). Heft (1989) suggests that potential affordances should be distinguished from actualised affordances. Kytta (2003:49) supported, ‘Potential affordances become qualities of the environment and the actualised affordances become individual relationships with the environment.’ In this study, the actualised affordances recorded the activities users undertook that were afforded by the design of the sensory garden. The potential affordances recorded a behaviour setting in the garden, such that it had the potential to offer an affordance but there was some design limitation that hindered uptake by the users.

2.6.3. *The types of affordances*

Kytta (2003) noted that users perceive two types of affordances: Positive and negative. Both of these types are determined by the quality of the behaviour settings that can be perceived through their senses. Positive affordances relate to the children’s movements and their perceptions of the environment, resulting in them offering satisfaction, finding it appealing and friendly, while negative affordances induce feelings of avoidance, danger, escape and fear (Heft, 1999; Kytta, 2003). However, according to Hart (1979) and Kytta (2003), children might also be interested in engaging with behaviour settings that are unsafe as they like to take risks when they are active in their surroundings. In this study, positive and negative affordances recorded different users’ responses to their experience of the sensory garden. Findings from the observation and behaviour mapping showed that both gardens afforded more positive affordances than negative ones.

2.6.4. Information

According to Gibson and Pick (2000), the environment provides information as ambient arrays of energy that is structured by surfaces, boundaries, events, objects and layout of the environment. The information perceived changes depending on the perceiver's movement (sitting, standing, walking, etc.) and their senses (sight, hearing, taste, touch and smell). These changes are essential for identifying, extracting and describing information about where one is, where one is going and what one is accomplishing. For example, users passing through the sensory garden often stop for a while to engage with the behaviour settings that are adjacent to the pathway. Their engagement enables them to experience different views of the garden.

2.6.5. Pickup information

In a view of children movement in experiencing the environment, Gibson and Pick (2000) classified two types of information pickup: Exploratory and performatory. The former permits children to discover the new properties of the environment and about their own capabilities, while the latter is the outcome of already learned affordances and relates to actions directed towards objects or an individual(s) within a setting for an intended purpose, for example, throwing, hitting, etc. 'Perception and action are closely intertwined in both exploration and performance, and learning is an important outcome of both types of action' (Gibson and Pick, 2000:21).

2.7. Behaviour setting

'Behaviour setting is an ecological unit where physical environment and behaviour are indissolubly connected in time and space' (Moore and Cosco, 2007:87). These eco-behavioural units were first described by Barker (1976) through direct observation of children (Cosco, 2006:22). Barker discovered that behaviour settings are composed of *entities* and *events* (people, objects, behaviour) and other processes (sound, shade, etc.). He added that their components are arranged functionally as part of the whole and their functions are independent of other adjacent eco-behavioural units. Behavioural setting is effective for analysing human spaces by disaggregating their functional parts (Cosco, 2006; Moore and Cosco, 2007). To put this in context, the concept of Barker's (1968) behaviour settings is closely related to the concept of affordances (Gibson, 1979; Gibson and Pick, 2000) that they are important features of the environment as both affordance and behaviour settings are properties of environment – person relationships (Heft, 2001). If landscape architects were to begin by looking at the action of affordances; the behaviour settings that are being used and the way users are engaging with these settings, this could suggest the potential of the sensory garden from a different perspective as cited by Heft (1989:10): 'The relationship between an affordance and behaviour is that of fittedness and compatibility'. It would have the advantage of not seeing disability as the starting point. This ties in with Barker's (1976) idea of behaviour setting, an idea of a sub-settled place where certain behaviours can come across and are likely to happen.

2.8. Affordances in the design of sensory gardens

The affordance theory raises questions that deserve exploration when considering the design of sensory gardens.




- How familiar are users with the environment and are they encouraged to interact with the behaviour settings in alternative ways? For instance, a water feature stimulates the sense of hearing but the feature also offers an opportunity to splash water around.

- What do users of sensory gardens usually do in terms of affordances? For example, rather than focusing on the footpath, bench or grassy area, it might be more beneficial to observe the frequency of activities such as running, leaning, crawling in this particular setting. In addition, it would be fruitful to consider the accessibility of these observed affordances, i.e. the potential for users’ physical engagement with the environment, whether the physical activity was accessible or was not being actualised because of barriers.
- Users’ experience of the sensory gardens and their engagement with the behaviour settings, further prompts the following questions: How do the settings afford users the chance to evaluate their benefits or disadvantages? Are the affordances in the sensory garden accessible? If not, why not? How have these affordances been actualised?

In this study, the concept of affordances is useful in describing the engagement between the users and the environment features and their responses as well as the possibilities that a sensory garden can offer users, whether or not landscape architects intended those possibilities when designing for sensory gardens. Moore and Cosco’s research on inclusive parks (2007) was relevant to this study since affordance and behaviour setting is two of their key theoretical frameworks.

3. Methodology

Table 1. Summary of the data collection at the case study site. Sources: Author (2009)

METHOD	RESPONDENT	OBJECTIVES
Interview with the landscape architects: At the place of their choice. During a walk-through in the garden.	Landscape architect (n=1)	To investigate the design process and landscape architect’s intention; To allow subsequent assessment of whether users utilise the space and elements in the way they are meant to be.
		
METHOD	RESPONDENTS	OBJECTIVES
Interview with the teachers and therapists.	Teachers (n=6) Therapists (n=3)	To enquire into their experience of and benefits in having the sensory garden; To assess the garden elements and any problems identified in the garden.
		
METHOD	RESPONDENTS	OBJECTIVES
Interview with the students with special educational needs.	Students (n=6)	To understand how students behave in the sensory garden thus providing information that observation alone cannot provide; To get information first hand from the students and to obtain their own responses.
		
METHOD	RESPONDENTS	OBJECTIVES
Observation and behavioural mapping.	All users of the case-study sensory garden	To understand how users behave and take advantage of affordances in space; To categorise all the different types of use (behaviour).

Due to the lack of information on the subject of ‘sensory gardens’, the limitations of time for research and the difficulties surrounding communication between the researcher and the students with speech, language and communication difficulties, two methods were thought to be the most appropriate:

Interview/Walk-through interview - This method had been used when gathering information from the landscape architects, teachers, therapists and a selection of students with special educational needs. Observation and behaviour mapping - This method had been used when collecting data of the users using the sensory gardens, particularly students with special educational needs, when the researcher found that it was difficult to get first-hand information from those who were interviewed (see Table 1). Affordance theory was used in conjunction with these methods, in order to find out which zones in the sensory garden were utilised by the users and what the frequency of this use was.

After the interviews with the landscape architects, teachers, therapists and students had been conducted, observation and behaviour mapping of on-site activities were undertaken. This data gathering was conducted in May (spring) and July (summer), for seven days each month. This time of year has possibly the best outdoor conditions and the period of observation was chosen to try to ensure that the daily variations in behaviour could be observed. The data was then recorded continuously from 8.30am to 3.30pm on weekdays, during the opening hours of the school during the term, for thirteen separate thirty-minute periods, on different days, and at different times of the day. While undertaking the behaviour mapping, observation notes were written up to provide a view of users' additional activities and potential affordances in the sensory garden. A few significant occurrences were used as anecdotal evidence to help interpret the results. Selections of photographs were also integrated to assist these occurrences. Behaviour mapping data later were keyed-in and analysed using Statistical Package for Social Science (SPSS).

4. Results and discussion

What were, and how did, the individual behaviour settings of the sensory garden, as engaged with by the users, contribute to their behaviour? From the landscape architect's design, sensory garden of the Lyndale Special School was divided into 4 zones with 27 individual behaviour settings, see Fig.1.(a),(b),(c),(d). These settings, afforded the students the chance to encounter some familiar features, such as the apple trees and unfamiliar features such as the tadpoles which the users found unusual to have in their pond. Both of these examples illustrate that the students respond differently when they encounter familiar or unfamiliar features. The individual behaviour settings also afforded the students the opportunity to interact with their peers, teachers and therapists. Among social skills recorded were talking about the scented plants and herbs, singing, laughing, cheering, communicating (including via sign language), reading and counting. As such, students' use of the sensory garden appeared to offer students a stimulating experience, as well as influence their behaviour and development in terms of social relationships.



Fig. 1. (a) Rainbow walk; (b) Water garden; (c) Green space; (d) Woodland garden. Sources: Author (2009)

Table 2. Matrix of the actualised affordances in relation to the landscape design categories, the number of users and the total time spent per user, utilising their sensory stimulation, physical and social skills throughout all the zones in the case-study sensory garden (Lyndale Special School in Liverpool, United Kingdom). Sources: Author (2009)

Functional zone/ Total area	Affords SENSORY STI. PHYSICAL and SOCIAL SKILLS	The Landscape Design Categories, the Number of Users and the Total Time Spent/Person (TTS/TTSP in min.sec)											
		Soft L.		No of Users		TTS/TTSP		Hard L.		No of Users		TTS/TTSP	
		Staf	Stud	Staf	Stud	Staf	Stud	Staf	Stud	Staf	Stud	Staf	Stud
<i>Rainbow Walk</i> (767sq.metres)	2 senses (8 activities)/ 2 phy.soc. (8 activities)	7	22	21	57.0	51.30	15	57	61	231.30	235.30	/4.06	/4.26
<i>Water Garden</i> (223 sq.metres)	3 senses (10 activities)/ 2 phy.soc. (3 activities)	9	28	43	48.0	85.30	11	13	41	16.30	51.30	/1.25	/1.25
<i>Green Space</i> (337 sq.metres)	4 senses (23 activities)/ 2 phy.soc. (12 activities)	41	91	87	94.30	83.0	49	71	109	195.30	350.0	/3.15	/3.21
<i>Woodland Garden</i> (556 sq.metres)	3 senses (12 activities)/ 2 phy.soc. (8 activities)	20	18	23	9.30	13.30	29	154	170	289.0	361.0	/2.28	/2.12

Functional zone/ Total area	Affords SENSORY STI. PHYSICAL and SOCIAL SKILLS	The Landscape Design Categories, the Number of Users and the Total Time Spent/Person (TTS/TTSP in min.sec)					
		Land F.		No of Users		TTS/ TTSP	
		Staf	Stud	Staf	Stud	Staf	Stud
<i>Rainbow Walk</i> (767sq.metres)	2 senses (8 activities)/ 2 phy.soc. (8 activities)	0	0	0	0	0	0
<i>Water Garden</i> (223 sq.metres)	3 senses (10 activities)/ 2 phy.soc. (3 activities)	0	0	0	0	0	0
<i>Green Space</i> (337 sq.metres)	4 senses (23 activities)/ 2 phy.soc. (12 activities)	1	1	0	12.0	0	0
<i>Woodland Garden</i> (556 sq.metres)	3 senses (12 activities)/ 2 phy.soc. (8 activities)	0	0	0	0	0	0

Analysis of the users and the total time spent per user engaging with the individual behaviour settings were divided into three categories: Soft Landscape, Hard Landscape and Landscape Furniture. From this, a matrix of the actualized affordances in relation to the landscape design categories, the number of users and the median time spent per user was produced, according to the zones in the sensory garden. These actualized affordances were then put into three categories: Sensory stimulation (touch, taste, smell,

hearing, sight); physical (mobility) and social skills (speech and communication) in a matrix form (see Table 2). These categories were produced from a combination of the taxonomy of environmental qualities by Heft (1988, 1999) and Kytta (2002, 2003) and drawing on this research experience, especially when dealing with students with special educational needs.

The results show that the richness and functionality of individual behaviour settings, located along an accessible and continuous pathway at the *Green Space* afforded users to engage with the settings, thus they will spend a longer time in this zone where, sensory experience were emphasised. *Rainbow Walk* had recorded the highest median time spent there per user as the teachers utilised this zone as their outdoor classroom for speech therapy. This analysis also shows that individual behaviour settings next to the pathway offer the potential for engagement but actually they are poor in experience. For example, the *Water Garden* recorded the least frequency of sensory affordances and the lowest median time spend per user, compared to the rest of the zones, because the sensory experiences offered there were limited. A high quality affordance experience would encourage users to stop, to engage with the various features and perhaps repeat the activity, as occurred in the *Green Space*. Zones also existed where an affordance offered greater scope for engagement with the individual behaviour settings but they recorded fewer users because, for example, the zone was slightly away from the main circulatory pathway, had poor access from the main building or it had limited access from the other garden zones, such as the *Rainbow Walk*. Landscape architects must ensure that a sensory garden offers multiple opportunities for affordances in terms of each of these categories. A poorly designed garden would offer none or perhaps only one affordance.

5. Conclusion

In the use of zones in the case-study sensory garden, it is clear that wherever there is access, the students will undertake a variety of activities and engage more with the individual behaviour settings compared to the staff. This contributed to the finding that the number of individual behaviour settings, the number of activities undertaken and the time spent engaged in that activity by the users was not dependent on the total area of the zone, nor did it relate to the median time spent there per user, but rather what did enable the usage was the functioning of the individual behaviour settings and access to them. Good pathway design and planning that connect school buildings to the sensory garden, as well as having the ability to move around the garden, promote educational development and social skills. This is one of the significant factors in encouraging the use of zone in special schools. This finding illustrates that users, especially students, enjoyed having functional and a variety of individual behaviour settings positioned, bordering an accessible and continuous pathway. Thus a higher number of users and a longer time spent were recorded in relation to these design qualities.

Drawing attention to the aesthetic value in relation to the use of zone in the sensory garden, landscape architects put this design aspect high on their list of priorities. The concept of affordance and the essential qualities of a children's natural environment have been described by Sebba as follows: '*Children judge the natural setting not by its aesthetics but by how they interact with the environment*' (Sebba, 1991, quoted in White and Stoecklin, 1998). Based on the research findings, it is clear that students with special needs do not appear to care about the aesthetics of a garden as they use the individual behaviour settings the way they want to use them (as long as there was access to the behaviour settings). Landscape architects think aesthetic value should be the key goal but 'sensory value' is the crucial design aspect, given that users engaged with the individual behaviour settings, involving greater use of their senses than just the visual and appreciation of the aesthetics. In other words, aesthetic value is not as important as sensory value. What the site or behaviour settings look like visually is much less important than how it feels, sounds, smells and tastes, as users getting access to the behaviour settings is very important. The

fact that users can get access to and engage with them is the key point when designing for a sensory garden. It is more to do with where the behaviour settings are sited rather than what they are.

In conclusion, it was a combination of soft, hard landscape and landscape furniture placed adjacent to a continuous primary pathway that offered easy access to the functional individual behaviour settings, and recorded the highest preferences. In other words, the layout of the pathway network linking the sensory garden to the overall site context is crucial in encouraging the number of users who will engage with the behaviour settings placed along it. It does not matter what sort of behaviour settings are included to offer variety to users - as long as they are accessible and functional, users will be engaged by them. This finding echoed research undertaken by Moore and Cosco (2007) on inclusive parks, which showed that a highly positive feature and the one that was the most popular among the users, was a wide pathway that gave access to the facilities that were readily accessible. It is the layout of the pathway, therefore, that enables user behaviour and use of zone rather than users seeking out corners which have particular individual behaviour settings. This is significant new knowledge, from a design point of view, indicating that pathway layout is more important than the particular design of individual behaviour settings, as long as the pathways are accessible.

Acknowledgement

The researcher wishes to thank her supervisors, Prof. Catharine Ward Thompson and Prof. Peter Aspinall of the Edinburgh College of Art; and Jane Stoneham of the Sensory Trust. Special thanks to Women Association, for funding and making this research achievable and lastly, all respondents, for their participation in this study.

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