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DESIGN OF SENSORY GARDENS FOR CHILDREN WITH DISABILITIES IN THE CONTEXT OF THE UNITED KINGDOM

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INTRODUCTION

The term ‘sensory garden’ has been very much over-used in recent years, but in a therapeutic context, it explains the sensory landscapes that have been specially designed to fulfil the needs of people who want to be involved in active gardening and who also enjoy the passive pleasures of being outdoors among plants (Gaskell, 1994; Philips et al., 2011). Lambe (1995:114) differentiated sensory gardens from any other garden by her statement, ‘The only difference in a sensory garden is that all attributes of hard landscaping, 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’. Shoemaker (2002:195) added, ‘Unlike traditional display gardens that are meant to be observed from a distance, sensory gardens draw the visitor in to touch, smell and actively experience the garden with all senses’.

The subject ‘sensory garden’ raised a number of preliminary questions for me as a researcher: Are not all gardens sensory? What is a sensory garden composed of? How do people use or benefit from sensory gardens? I undertook a review of the literature to find out how best to approach the subject of ‘sensory gardens’. However, the review showed that there had been a lack of rigorous research on the subject and research issues could not readily be identified. I decided that the best approach would be to conduct preliminary site studies, mainly by visiting places that claimed to have or be sensory gardens (fourteen of them) and to find out what made them so through personal observations of the use of these gardens and interviews with the garden users, key experts and designers.

Six main findings arose from these preliminary site studies:

i) Water is an important feature in that it provides users with the opportunity to respond to it through hearing and touch. In some sensory gardens, however, water is not fully accessible, therefore, such features are not of true benefit to the users. Some sensory gardens also lack this feature.

ii) Ramps, even with an accessible gradient, were not appreciated by the garden users, who were concerned about slippery surfaces. Steps were also not favoured, especially by wheelchair users and their carers.

iii) Loose materials on the surface of paths, such as gravel separated by wood edging, are inaccessible to wheelchair users. Therefore, such users are unable to appreciate significant features that can only be accessed in this way. (Not all features will be accessed by loose-surface paths. The loose surface is problematic for some users, particularly for students in wheelchairs, if it is the only form of access. On the other hand, if the school is unlikely to have wheelchair users, the use of loose surfaces can be sensorily stimulating and pleasant for users with other disabilities.)

iv) Regardless of who designs a sensory garden – a landscape architect or a joint community or school effort – challenges in terms of long-term maintenance should be addressed in the design plan. If they are not, a poorly maintained sensory garden will not benefit its users and it will lack aesthetic value.

v) Sensory gardens which are designed as such, tend not to be entirely satisfactory from the users’ perspective; some designers, apparently, may not interview the users to determine their needs and preferences before designing the garden in detail.

vi) There are no design guidelines for sensory gardens (although there are some publications on anthropometrics for a variety of users, including disabled people). The design of sensory gardens relies on the experience and attitude of designers.
This chapter presents the experience of children with special needs and their adult carers in the multi-sensory learning environment, which is based upon the walk-through interviews, personal observations and behavioural mapping of the case study examples I carried out for my doctoral research (Hussein, 2009; Hussein et al., 2015). In this study, observation notes of the users’ activities in the sensory garden were written up while undertaking the behaviour mapping. As a result, in order to interpret the results, a few significant occurrences were used as observations with the integration of a selection of photographs to illustrate these occurrences. The difference between how the landscape architects and school staff anticipated users would behave during the interviews, and what was recorded during the observation periods in the case studies, is an important finding to highlight in this study.

**MULTI-SENSORY ENVIRONMENT**

For the purpose of the study presented in this chapter, the term ‘multi-sensory environment’ will be used when describing the type of approach to which students with special educational needs could be exposed, namely, to an environment that is designed to offer sensory stimulation through all the senses using textures (touch), colours (sight), scents (smell), sounds (hearing), etc.

The evolution of multi-sensory environments began within indoor settings in the 1970s (Hulsegge et al., 1987; Hirstwood et al., 1995; Hogg et al., 2001). However, it was only in the late 1980s that designers started to take account of visual and aural ambiances and to install equipment that could accommodate, in special schools and nursing homes, the needs especially of people with profound and multiple disabilities (Mount et al., 1995). Hogg and Sebbas’ (1986) and Longhorn’s (1988) research examined the development of auditory, physical and visual impairments in people with profound and multiple learning disabilities and they developed appropriate multi-sensory curricula to address each. Longhorn suggested, ‘without stimulation and an awakening of the senses, children with profound and multiple learning difficulties would find it almost impossible to make sense of their experiences and to begin to learn’ (quoted in Mount et al., 1995:52). As a result, a multi-sensory curriculum was integrated into the special needs educational system to satisfy the United Kingdom’s national curriculum (Byers, 1998).

Following on from the recognised positive benefits of multi-sensory indoor experiences, outdoor sensory gardens have logically developed (Nebelong, 2008). The only functional difference between them is that the cost of a sensory garden is considerably less and it is a truly natural multi-sensory environment compared to a manufactured multi-sensory or ‘snoezelen’ room (Lambe, 1995).

Each adult working with a child with multiple disabilities has an important role in ensuring that the child is able to make sense of the environment using appropriate information from a range of sensory channels. In attempting to provide the child with a balanced understanding of the environment, the adult will need to structure on appropriate learning environment which can be both reactive to the child’s actions and responsive to the child’s needs.

(Bell, 1993, quoted in McLinden, 1997:321)

Nowadays, multi-sensory design in the context of a garden is becoming increasingly popular for educational purposes in special schools (Building Bulletin 102, 2008; Westley, 2003; Woolley, 2003; Frank, 1996; Stoneham, 1996; Titman, 1994; Winterbottom et al., 2015); for rehabilitation purposes in hospitals (Cooper Marcus et al., 1999; Tyson, 1998; Cooper Marcus et al., 2014; Winterbottom et al., 2015) and for health benefits in nursing homes (Stoneham, 1997; Stoneham et al., 1994; Winterbottom et al., 2015).

Having a multi-sensory environment in a special school is beneficial for both teachers and students as it provides a two-way learning process. Learning through Landscapes, an association formed in 1990 in the United Kingdom, has conducted research concerning children with special educational needs in outdoor areas. The findings made
it apparent that teachers appreciate outdoor areas a foundation for the education of children with special educational needs. As their paper in *Building Bulletin* 77 (1992:49) outlined, ‘Outdoor 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 echoes the beliefs of Long and Haigh (1992), Titman (1994), Rohde and Kendle (1994), Lucas (1996), Stoneham (1997), Moore (1999), Malone and Tranter (2003), Woolley (2003), Maller and Townsend (2005/2006), Souter-Brown (2015) and Winterbottom and Wagenfeld (2015), that outdoor environmental learning can influence children’s behaviour in terms of reducing aggression and assist in their development in terms of mental health, emotional and social relationships as well as providing a stimulating sensory experience, especially being in contact with animals and plants. This notion has received further support from a teacher at one of the case-study sites who noted: ‘Pupils are most likely to succeed when they are involved in “doing” activities rather than academic learning’. Multi-sensory environments are used by individuals with all kinds of disabilities in special schools where this offers them the opportunity to engage in self-stimulating activities while enhancing learning opportunities outdoors.

One way of achieving a multi-sensory environment is to have plants that are both functional and able to provide visual stimulation through the use of colours, tactile stimulation through textures and olfactory stimulation through different scents (Hussein, 2005; Cooper Marcus* et al.*, 2014; Souter-Brown, 2015; Winterbottom* et al.*, 2015). These plant qualities must be carefully considered so that they are pleasant and also stimulate experiences. It was observed in one school garden that the staff and students liked to brush their legs and hands against lavender bushes while walking on the paths. A few of them smelt their hands after touching them. In an interview I conducted with a teacher at one of the case study sites, she mentioned a particular child with poor sight who successfully navigated her way around the sensory garden using the scent of lavender and that when she (the child) smells it, it reminds her of her mother at home, who had planted it in their garden. Lynch (1960) described what he termed the *imageable* elements of the environment. These are not necessarily visual; they can be distinctive sounds, smells or tactile experiences. Encountering familiar features and recognisable landmarks may help way-finding (Lynch, 1960; Kaplan, 1976; Kaplan* et al.*, 1998). The key aspect of designing for way-finding depends on the distinctiveness of landmarks, their placement and the way they can connect between spaces. A range of different sensory experiences, which would encourage a greater understanding and exploration by users of a sensory garden, could help to increase users’ enjoyment of an environment. However, if these are not met, users may feel frustrated and even threatened; thus, it will add to their fears and apprehension of getting lost. When users feel orientated, their eagerness to explore the environment is increased and their general anxieties are lessened (Kaplan* et al.*, 1998).

**SPECIAL EDUCATIONAL NEEDS AND DISABILITY**

The term ‘special educational needs’ covers an array of difficulties highlighted in the 2001 Special Educational Needs Code of Practice in the United Kingdom, which ‘recognises a wide spectrum of special educational needs that are frequently inter-related, although there are also specific needs that usually relate directly to particular types of impairment’. The Pupil Level Annual Schools Census data set was amended in 2004 to include twelve 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 impairment; visual impairment; multi-sensory impairment; physical difficulty; Autism Spectrum Disorder; other. Most of the sensory gardens visited as part of my research provided access to children with at least one, often more of the special educational needs, as categorised on p.000. In this chapter, the term ‘special educational needs’ will be used when referring to the ‘students’ of the case-study sensory gardens.

Mount* et al.* (1995) and Chawla* et al.* (2002) mentioned the richness of the visual, auditory and tactile stimuli that gardens can offer and the opportunities for exploration and how they could therefore 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 to a greater or lesser extent. As garden designer Noel Farrer, of Farrer Huxley Associates (2008:17), states: ‘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’. He added that practitioners can draw together relevant information from Building Bulletins 102 (2008) and 77 (1992), which provide a comprehensive framework and guidelines for designing for children with special educational needs. Case studies and illustrated examples show how these can be put into practice.

Passini and Proulx’s (1988) and Jacobson’s (1998) research found that it is easier for a visually impaired person to orientate and navigate outdoors when landmarks and paths are distinguishable through texture or other means to provide clues, such as surface changes. Tyson (1998:75) noted that ‘the planting composition, strategic location and significant elements could orientate people with impairments around green spaces’. Kaplan et al. (1998:50) supported this, stating: ‘The distinctiveness of such elements, where they are placed, and the number of them are all key aspects of designing for way-finding’. This was evident during one of my observation days at the case study sites. ‘Eileen’, who has special educational needs, was able to find her way back to her classroom after a literacy session through the use of plants. In other words, users respond in fundamentally different ways when they encounter familiar or unfamiliar features which challenge their perception and movement. Furthermore, the various garden attributes motivate them to practice their motor skills and use them for way-finding. This is important for facilitating children’s educational development and social interaction.

McLinden et al. (2002:54) differentiate between the close (or proximal) senses (touch and taste), and the distance senses (sight, smell and hearing). They note 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 my observation period at the case study gardens, 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 Central Water Area of the garden for a longer period.

DESCRIPTIVE SUMMARIES OF THE CASE STUDIES

It was vital to choose sensory gardens which had been designed by landscape architects. The potential final case studies were short-listed based on a set of five criteria:

i) Completed and operational. The sensory gardens in these case studies had to have been completed and in use for the outdoor activities they were offering.

ii) The design and its recognition. The selected sensory gardens must offer a variety of attributes and had to be recognised for their good design, as evidenced by being reviewed in landscape architecture websites and magazines. In addition, they had to have been recommended by Jane Stoneham of the Sensory Trust, the key expert in this area.

iii) Accessibility. The availability of information about the chosen case studies and easy access to them were important for the practicality of the research.

iv) The spatial location. The location of the sensory garden in relation to the associated school building was considered, in order to find out whether this aspect would influence how the area was used, whether this factor was likely to result in high levels of use and whether landscape architects took that aspect of accessibility into account during design.

v) Time and funding. Choice of site locations was also limited by what could be achieved with the funding available and the time required to conduct my research.

Of the fourteen potential sites for study across the United Kingdom, two sites were chosen, based on these key factors: Lyndale School and the Royal School for the Deaf and Communication Disorders.
Lyndale School in Liverpool is a non-residential special school for children with complex needs, and profound and multiple disabilities. It caters to children from the ages of two to eleven years. A landscape architect from Groundwork Wirral, Mark Boothroyd, designed the sensory garden, which was completed in 2005. The project’s success relied on extensive local community fundraising. The garden is attached to the school building, with an open view to the residential backyard. It has a linear form with a combination of flat and undulating topography. The school relies on volunteer efforts for the garden’s maintenance. The sensory garden has four themed zones: (A) Rainbow Walk, (B) Water Garden, (C) Green Space and (D) Woodland Garden (Figure 4.1).

The Royal School for the Deaf and Communication Disorders (RSDCD) in Manchester is a residential, co-educational special school and college. The students’ disabilities range from severe and complex learning difficulties, autism, emotional and behavioural difficulties, multi-sensory impairment, to medical, physical and language disorders. Their age range is from two to twenty years. The sensory garden was designed in 2000 by Sue Robinson, a landscape architect from Stockport Metropolitan Borough Council. The garden, called the Multi-Sensory Millennium Maze, is situated in the middle of the school, between two buildings. It is a square form: a courtyard with flat topography. The sensory garden has six themed zones: (A) Parents’ Waiting Area, (B) Exploraway, (C) Green Space One, (D) Green Space Two, (E) Asteroids Arts Garden and (F) Water Central Area (Figure 4.2).

**RESEARCH STRATEGY AND METHODS**

In an interview I conducted with a retired deputy head teacher at Lyndale School, she mentioned that, ‘Every special school has slightly different needs. The sensory garden will reflect those needs, so no sensory garden will be the same. They might have similar elements but there will always be an emphasis upon the needs of their individual children’. Following on from that statement, the objective of this study is to observe and record how children with special needs and their adult carers responded to and engaged with the attributes in a sensory garden.

In this study, the focus of the analysis was on observation and behaviour mapping. The interview material is the secondary data of the study (see Table 4.1). While undertaking the behaviour mapping, observation notes were written up to help to interpret the results. The similarities and differences between the interviews and observation results could be used to inform landscape architects’ future practice and/or educators when designing for sensory

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**FIGURE 4.1** Plan of the sensory garden, showing the themed zones at Lyndale School  
Credit: University Malaya Press
**TABLE 4.1** The sequential method used for data collection with the landscape architects and school staff for their respective sensory gardens

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<thead>
<tr>
<th>Method</th>
<th>Respondents</th>
<th>Objectives</th>
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<tbody>
<tr>
<td>i) Interview with the landscape architects was conducted in two sessions:</td>
<td>Lyndale School (n=1)</td>
<td>To investigate the design process and the landscape architect’s design intentions.</td>
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<tr>
<td>• At a place of their choice</td>
<td>RSDCD (n=1)</td>
<td>To find out the challenges he or she had to deal with.</td>
</tr>
<tr>
<td>• A walkthrough in the sensory garden.</td>
<td></td>
<td>To allow subsequent assessment of whether users utilise areas and garden attributes in the way they are meant to.</td>
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<td>ii) Interview with the teachers and therapists at the sensory garden.</td>
<td>Lyndale School (n=9)</td>
<td>To enquire their experience of and benefits in having the sensory garden.</td>
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<td></td>
<td>RSDCD (n=6)</td>
<td>To assess the garden attributes and any problems identified in the sensory garden.</td>
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<td>iii) Observations and behaviour mapping were conducted in May and July, for seven days each month, on weekdays during the opening hours of the school during the term.</td>
<td>Lyndale School and RSDCD (All users)</td>
<td>To understand how users behave in the sensory garden and engage with the garden attributes.</td>
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gardens. For example, they should ensure that all users are offered a variety of activities to engage with the garden attributes as well as minimising barriers to allow users full access to and from the garden. When presenting the findings, these two aspects are integrated together.

THE SIMILARITIES BETWEEN THE TWO GARDENS

The most successful attributes in terms of usage recorded during the observation period at RSDCD were the mobility on pathways and pathway varieties. The landscape architect mentioned that she had seen how users utilised the pathway; directionally and criss-crossing from one end to another. This aligned with her design description to provide a strong overall framework to channel and encourage movement from one area to another. The sensory gardens in both case study sites are used as a place to conduct speech therapy. One of the standard multi-sensory curriculum items, which is used by teachers in all special schools, is PECS (Picture Exchange Communication System), which involves showing photographs and finding objects in the sensory garden using touch, hearing, smell and sight. This exercise is beneficial for wayfinding and identifying significant attributes in the sensory garden. The following observation illustrates how a speech therapist used the images on the rubber walkway at Green Space Two (see Figure 4.3):

One afternoon, a therapist and a student with speech difficulties were strolling in the sensory garden. When the therapist reached the rubber walkway, she jumped onto one of the images and said, ‘Flower!’ Then she jumped from the ‘flower’ onto a blank space and let the student jump onto the flower image. The student copied what her therapist had done and responded very well. Seeing that the student had behaved positively, the therapist continued jumping onto a series of different images until the end of the walkway.

FIGURE 4.3 Location where a speech therapist and a student with speech difficulties were recorded using the images on the rubber-surfaced walkway to encourage verbal communication
Source: the author
The observation at Lyndale School identified that the boardwalk and path network at the Water Garden were the least used parts of the garden. Teachers said that they were concerned about the boardwalk near the pond because it was slippery and hazardous for students. As a result, they used the steps instead. In addition, students in their wheelchairs wanted to continue their exploration of the boardwalk but could not do so because the path came to an end. This corresponded with the landscape architect’s interview where he said that the surface material and accessibility of the boardwalk were not constructed as he had originally envisaged. Teachers also expressed their frustration about the fact that at that time the interactive fountain was not working, because their students loved watching the water and talking about it. When the landscape architect was asked about this, he thought it was a technical problem at that particular time.

The observations at RSDCD showed the least-used themed zone to be the Exploraway. Although this is the second-largest area, users engaged with its features such as the lawn patch, lighting bollards, gravel surface and path. These elements are few compared to the other areas in the sensory garden. The Exploraway with its gravel surface was underused because the gravel surface is unsuitable for wheelchair users and mobility exercise. For example, students on a specially-adapted bicycle wanted to cycle on the Exploraway but they did not do so because of the surface material. The school staff concurred with this view and according to the landscape architect, the Exploraway should be bumpier in order to offer a better mobility challenge, hence she also thought this area to be the least successful part of her design.

At Lyndale School, while the landscape architect predicted that the feature that would be most frequently used and popular would be the sound stimuli at the Woodland Garden, he was surprised to see that the majority of students were drawn towards this. The observation data demonstrated that this area was the most used, especially by partially-sighted students who liked to touch, feel and hold the rope railing while walking on the boardwalk. The following observation illustrates how a student runs about and listens to the sound stimuli:

A young boy was walking hand in hand with his teaching assistant in the sensory garden. Both of them were silent – listening to the humming insects, chirping birds and the wind in the leaves. As they were strolling together, one of the sound stimuli went off by itself. The boy let go of his assistant’s hands and ran towards the source of the sound. Soon he managed to find the source of the sound, he walked towards the researcher and asked, ‘Are you here to see the flowers? It’s a nice garden, isn’t it?’ He then smiled and continued strolling with his teaching assistant.

THE DIFFERENCES BETWEEN THE TWO GARDENS

The landscape architect of RSDCD’s sensory garden predicted that the Asteroids Arts Garden and the Central Water Area would be the most popular. This is because the Asteroids Arts Garden was particularly requested by school staff during the sketch design phase and the Central Water Area is located at the centre of the sensory garden, which she thought would be fairly well maintained. However, three of the school staff pointed out that although the musical instruments are located along the path, they are inaccessible to wheelchair users and do not produce much sound. At the Central Water Area, the observation results showed that students in wheelchairs wanted to feel the water but could not manage to do so because of the shrubs around it. This concurred with information provided in an interview with the teachers. The students also wanted to touch the plants in the raised beds but did not manage this either, because of the height of the wall; students who were more mobile had to step over or on the shrubs planted around the water feature before they could touch the water. Inevitably, some parts of the planting beds were sparse due to this (Figure 4.4).

School staff at RSDCD mentioned that due to the willow tunnel’s location in the sensory garden, this is the least successful feature in terms of use. However, during the observation period, I found that students were fond of
willow weaving and engaging with the artwork display in the willow tunnel. A partially-sighted student and a student in a wheelchair were also observed using the willow tunnel. The students were fearful of going into the tunnel because of the changes in the surfacing material so that teachers had to cheer them on and convince them to walk through it. The following observation illustrates how the willow tunnel at Green Space One was used:

One morning, two teachers decided to experience the willow tunnel with one student who was in a wheelchair and one student who was partially-sighted. The two teachers went through the willow tunnel and waited for more than five minutes as both of their students had a fear of going through the tunnel due to the changes in its material on the floor surface. One of the teachers tried to convince both students by saying, ‘Come on, Steve…you can do it!’; while the other teacher walked through to the end of the willow tunnel and said, ‘Look! I’m here’. The students looked surprised. Then she walked back through the willow tunnel and cheered on both students to join them. The partially-sighted student put one foot tentatively on the chip-bark surfaces. He then smiled and walked slowly towards his teachers. As he approached, one of the teachers held his hands and said, ‘Yes! You’ve made it!’ The other student in his wheelchair was still on the pathway. He looked confidently at his mate and slowly wheeled his chair onto the bark surface. They continued to cheer him on. As he came closer to them, one of the teachers said, ‘Well done, Steve!’. They then engaged with the willow tunnel. One teacher and student played with some of the artwork displays while the other pair spread their arms wide while feeling the willow. The four of them finally walked towards the end of the willow tunnel and returned back to the pathway. Besides experiencing the features of the willow tunnel, it also increased the students’ confidence.

The sensory garden at Lyndale School is often used as an extension of the school classrooms and provides teachers a creative alternative location to conduct speech therapy. The landscape architect of Lyndale School’s sensory garden predicted that the least used themed zone would be the Rainbow Walk (Figure 4.5). This, he felt, would be due to the relative poverty of features and lack of maintenance. However, the teachers preferred to use this area as an outdoor classroom in support of communication therapy.
The following observation illustrates how users of the sensory garden used the Rainbow Walk as an outdoor classroom:

One morning, a group of female staff and students with various kinds of impairment were walking hand in hand through the sensory garden of the school to find the perfect tree to do some bark-rubbing. As they neared a huge shady tree, a teacher said, ‘Let’s feel this tree’. She placed her hands on the tree trunk. A male student moved his hands over the bark and slid his arms around the trunk until they met. His face was touching the bark and he said, ‘This is the perfect tree!’ So they all got out their paper and pencils and started a bark-rubbing activity.

Another observation demonstrates how a group of teachers wheeled their students with special educational needs out from their classroom to the *Rainbow Walk*:

![Figure 4.5: Rainbow Walk](image-url)
The morning weather was fine with sunny spells and the wind was blowing in between the leaves. ‘Do you know where we are going, David?’ asked a teacher. ‘David’ jumped in his wheelchair while his hands grasped the armrest. He was making a loud sound, showing anticipation. As the large group reached the area, they formed a circle around the conifer tree. As the teachers and students gathered in pairs around the conifer tree, with a plank as the floor surface, the teachers sang, ‘Here we go ‘round the mulberry bush’. As they chanted, I thought it was a perfect song to sing, as it invited many physical movements that generated sound and vibration for the students, such as stamping, jumping, skipping, clapping and cheering. The students responded positively by swinging their hands while turning their heads from one side to another. Some students opened their mouths and tried to mimic their teachers. This observation illustrates that the design of the sensory garden challenges the students’ perception and motivates them to practice their literacy skills.

**DISCUSSION**

The findings showed that the teachers and students prefer areas with hard surface paths, allowing accessibility and easy way-finding into the sensory garden and back to the school building, as well as having the ability to move around the garden. This helps to promote educational development and social skills. They also favour zones with different functional and garden attributes placed directly next to an accessible and continuous path. This enables users to engage with it easily, thus affording them a richness of activities in the sensory garden. This concurs with Cosco’s (2006) study on physical activity affordances in preschool play centres: that diverse areas comprising paths and features are likely to be the most active. This also echoed research undertaken by Moore et al. (2007) on inclusive parks, which showed that a wide pathway that gave access to the facilities that were readily accessible was a highly positive feature and the most popular among the users. Another of their findings was that a winding pathway afforded inclusion and added visual interest to the pedestrian experience. Winterbottom et al. (2015) also agreed that meandering garden paths may offer richer experiences for therapeutic relief and sensory stimulation to the users. This raised another question in my mind about the direct pathway at RSDCD compared to the curving one at Lyndale School: Does the formation of a path play an important role in encouraging the richness of activities and behaviour? The study looked back at the overall design framework related to the path layout of both sensory gardens.

The landscape architect intended, when designing RSDCDs’ sensory garden, to improve the sense of direction, to offer paths of different widths and textures and to provide areas which offered a rich experience within a protected environment. For Lyndale School, the landscape architect intended to maximise the potential of the site with landform and to create a meandering path network that would provide a range of options and opportunities to move through spaces along the way. When the uses in both sensory gardens were recorded and compared, it seemed clear that users preferred to stroll on continuous paths, linking one zone to the next with readily accessible and functional features next to the paths. It is the layout of the path, therefore, that enables user behaviour and use of an area, rather than users seeking out corners or zones which have particular individual attributes. Thus, a higher number of users and a longer time spent there were recorded in relation to these design qualities. This is significant new knowledge, from a design point of view, indicating that path layout is more important than the particular design of features, as long as the pathways are accessible. This matched the idea of teachers of RSDCD to provide a ‘sensory trail’. How is a ‘sensory trail’ different from a sensory garden? In the sensory garden, users are encouraged to maximize their enjoyment and engagement of their senses. The features in their sensory garden that the landscape architect aimed to maximise enjoyment need to be adjacent to the path. Ideally, a sensory garden should have a continuous circulation network that links all zones with easy access to the different features. Thus, what a landscape architect should be designing is a garden that is linked by a sensory trail which, in one sense, becomes the sensory garden.

The findings further suggest that a successful sensory trail comprises a combination of natural and manmade elements in a specific zone, along with a sufficient quantity of furniture such as seating, lighting and shelters. This
would help to form the composition into a coherent whole within the sensory garden for easy wayfinding, generating activities and responses. Landscape architects can be given improved guidance about how spaces in the garden could be structured, offer a richness of activities and lessen the number of barriers that obstruct access. Another contribution to knowledge is the design aspect of sensory value. Users of the sensory garden thought that the features should not just be aesthetically and visually attractive, but that they should also be nice to touch, hear, smell and taste. In other words, aesthetic values should be formed from all sensory possibilities. In fact, in the context described here, what the site or features look like is much less important than how they feel, sound, smell or taste, since giving users maximum access to the features with these multi-sensory attributes is very important. The ability of users to engage directly with the sensory features is the key point when designing for a sensory garden. It is more to do with where the features are sited than what they are.

CONCLUSIONS

As the two case studies have shown, the integration of sensory garden design into the overall design of special schools, and including their use in the curriculum, could encourage the creation of an outdoor environment which could offer a wide range of multi-sensory learning experiences for students with special educational needs. The students’ experiences at RSDCD and Lyndale School showed positive user functioning in three respects: sensory stimulation, physical (mobility) and social (speech and communication). For example, for students with special needs (RSDCD), getting to and around the sensory garden, then back to the school building (way-finding), was particularly important, as many, if not all, had some form of mobility impairment.

Landscape architects should ensure, firstly, that sensory garden design is integrated into the overall planning phases of the development (or re-development) of a special school. Secondly, they should recommend that students (and their carers) are involved in the design of their sensory garden. These two recommendations, if followed, would foster greater design integrity of the entire school plan.

Landscape architects should observe and record users’ daily routines, to gain a better understanding of the activities and the way users perceive them. In so doing, the landscape architect, teachers and therapists could make sure the design phase and its realisation enable part of the school curriculum to be taught there, and to view the garden as an area which offers the potential for learning, rather than just as an outdoor area which is there to be used only in breaks from classroom learning.

Landscape architects should consider accessibility to, and the functionality of, the constructed surfaces and elements (including water features and artefacts), vegetation and natural elements (including animals and microclimate) and landscape furniture (for example, seating, lighting, signage and shelters). With a continuous circulatory path network, user enjoyment of and engagement with the individual elements is likely to be enhanced, so they are used as markers and trigger memories; the sensory trail is one very good way to achieve that.

Landscape architects must think about maintenance and upkeep because there is no point in having carefully designed landscapes unless they can be properly maintained (for example water features that break down are particularly disappointing). It would be useful for landscape architects to translate their design intentions effectively into a set of detailed construction drawings for the groundwork department of the school, as well as to produce a comprehensive maintenance and management schedule that would be easy to understand by the school maintenance staff or volunteers. Design consultants could also train the appointed maintenance contractors in how to look after the sensory garden.

Finally, landscape architects must also consider health and safety and risk assessment concerns when providing challenges to meet different user abilities, for example, in the Exploraway at the RSDCD. Although different surface
materials should be considered, designers should bear in mind that being wheeled over a rough and bumpy terrain may not always be a pleasant experience, particularly for someone with limited mobility. Nevertheless, landscape architects should try to offer as wide a range of challenges in a garden as possible, to match the ability range and ages of the students. Where a school’s intake is likely to change over time, landscape architects should consider leaving scope for further development of the garden. This would allow levels of challenge to be added later, for uptake by users whose capabilities were suited to them, or who, with the encouragement of their teachers and carers, could rise to such new challenges, for example, the willow tunnel at RSDCD or a ‘wobbly-wobbly way’ that is wheelchair accessible (Stoneham, 1996:50).

This chapter has illustrated the strengths and weaknesses in two sensory gardens in two special schools by evaluating their areas and attributes and how they were used by children with special educational needs and their adult carers. When I interviewed Jane Stoneham, director of the Sensory Trust in the United Kingdom, she said that landscape architects make many assumptions about how disabled people navigate and benefit from an outdoor environment. She added that detailed guidelines for sensory garden design are few, a view endorsed by designers such as Petrow (2006), Mathias (2006), Robinson (2007) and Boothroyd (2007) (in interviews with the author). My findings can support a further improvement in, and the creation of, a higher standard of sensory garden design by landscape architects. These recommendations, when integrated into detailed guidelines, as Stoneham and others recommend, would support better design of coherent garden spaces, further learning experiences and greater enjoyment, within users’ physical, mental and sensory capabilities. In a talk given by Clare Cooper Marcus, an expert in healing gardens at Edinburgh College of Art (6 March, 2009), she said, ‘Landscape architects should design gardens, not architects. You do not want a brain surgeon to replace your hip, do you?’

REFERENCES


