National Foundation for Educational Research

Impact of school gardening on learning

Final report submitted to the Royal Horticultural Society

Rowena Passy
Marian Morris
Frances Reed

Contents

Acknowledgements i

Executive Summary ii

1. Introduction 4

1.1. The RHS campaign 5

1.2. The research study 6

1.3. The case-study schools 7

2. Gardens in Practice 11

2.1 The starting point 11

2.2 Managing the school garden 12

2.3 The RHS Campaign for School Gardening 14

3. Learning through gardens 18

3.1 Cognitive outcomes 19

3.2 Affective outcomes 22

3.3 Behavioural/physical outcomes 25

3.4 Interpersonal/social outcomes 28

3.5 Embedding the garden into the curriculum 30

4. Every Child Matters 34

4.1 Be healthy 35

4.2 Stay safe 36

4.3 Enjoy and achieve 38

4.3 Make a positive contribution 39

4.4 Achieve economic well-being 40

4.5 Community cohesion 42

4.6 In summary 43

5. Reflections and recommendations 44

5.1. For Primary Care Trusts, the School Food Trust and CAMHS 44

5.2. For Local Authorities 45

5.3. For Schools 46

5.4. For the RHS and the Campaign for School Gardening 47

5.5. In summary 47

A. Methodological appendix 49

A.1 Phase 1 Desk study 49

A.2 Phase 2 Case studies 51

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Executive Summary

Following the launch of the Campaign for School Gardening in 2007, the Royal Horticultural Society (RHS) commissioned the National Foundation for Educational Research (NFER) to assess the impact of school gardening on children's learning and behaviour. This report presents the findings from the qualitative study of a representative sample of ten schools participating in the Campaign. The key findings are as follows:

- The overarching aim of the Campaign is to raise the profile of gardens as a natural, sustainable resource that has the capacity to offer curricular, social and emotional benefits to pupils. The findings show that the Campaign can support schools in addressing these issues in a whole-school context.
- The RHS Campaign for School Gardening has been successful in recruiting 11,500 primary schools. Its most noteworthy contributions have been the ways in which it has provided a focus and structure for the organisation of (often pre-existing) gardens in schools, facilitating progress and recognising and rewarding their efforts. Schools have particularly welcomed the support and training that the Campaign has made available.
- Outcomes from involving pupils in school gardening were reported as including:

  - Greater scientific knowledge and understanding.
  - Enhanced literacy and numeracy, including the use of a wider vocabulary and greater oracy skills.
  - Increased awareness of the seasons and understanding of food production.
  - Increased confidence, resilience and self-esteem.
  - Development of physical skills, including fine motor skills.
  - Development of a sense of responsibility.
  - A positive attitude to healthy food choices.
  - Positive behaviour.
  - Improvements in emotional well-being.

- School gardens have proved to be a source not only of learning outcomes for pupils, but also for other wider outcomes around both the Every Child Matters agenda and the wider duty of community cohesion. Schools had used the gardens to promote the development of active citizens as well as independent learners and had observed changes not only in the children, but in attitudes to the school within the local community.
- Schools reported a number of key ingredients to embedding gardening into the curriculum. These included the active support of the headteacher, a key member of staff who drives the work in the garden, ensuring the amount of work is manageable, and giving the garden a high profile within the school.

- Challenges with managing the garden within schools included the time and effort involved in developing and managing the site, funding, and involving the whole school community. Schools reported a range of both strategic and practical responses to these challenges.

1. Introduction

The Campaign for School Gardening, launched in 2007 by the Royal Horticultural Society (RHS) has a place in the growing number of educational initiatives (such as healthy schools, sustainable schools, eco-schools, the Forest Schools movement and Building Schools for the Future) that have sought to bring together the two key issues of sustainable development and healthy living in recent years. Increasing focus on these matters has been evident in politics, in academic life and in the media, with concerns voiced about environmental damage, rising rates of obesity, decreased physical activity in childhood and a belief that children and young people are increasingly distanced from the natural world, something that Louv (2008[1]) calls 'nature deficit disorder'. No one initiative can address all of these concerns, a fact recognised in the Learning Outside the Classroom Manifesto (2006), which encouraged schools to provide all children with high-quality outdoor education throughout the course of their school life [2].

Research suggests that such endeavours can expand pupils' awareness of the natural world and promote their cognitive, social and personal development (Davis and Waite, 2004[3]; Dillon *et al.*, 2005[4]). Learning outside in the natural environment is thus believed to make an important contribution to learners' behaviour as well as to their motivation and attainment. Part of this entails developing pupils' understanding of their own surroundings so that they might understand their environment and be informed participants. For many schools (and for many children), however, programmes of outdoor learning that involve travel, and its attendant costs and risks, are not always feasible. Attention turns, therefore, to the school grounds and an increasingly important part of outdoor education comes in the form of schools integrating the use of their own grounds into the curriculum; school gardens are seen as playing a critical role in this. The Department for Children, Schools and Families (DCSF) website listed a number of school garden-related activities, including Growing Schools Garden, Duchy Originals Organic Gardens for Schools, Morrison's 'Let's Grow' Campaign, Get Your Hands Dirty and the Royal Horticultural Society's

1 Louv, R. (2008) *Last Child in the Woods: Saving our children from nature-deficit disorder*, New York: Algonquin Books of Chapel Hill.

2 DfES (2006) *Learning Outside the Classroom Manifesto*. London: HMSO.

3 Davis, B & Waite, S. (2005) *Forest Schools: an evaluation of the opportunities and challenges in Early Years. Final report*, http://www.edu.plymouth.ac.uk/oelresnet/waite.html.

4 Dillon, J., Morris, M., O'Donnell, L., Reid, A., Rickinson, M. & Scott, W. 2005. *Engaging and Learning with the Outdoors: the final report of the outdoor classroom in a rural context action research project*, Slough: NFER.

(RHS) Campaign for School Gardening. Amongst this array of targeted outdoor initiatives, what has been the particular contribution, if any, of the RHS Campaign to children's learning, understanding and behaviour?

1.1. The RHS campaign

The RHS Campaign has four aims and objectives:

- To encourage all schools to get growing, and to acknowledge the right of every child to get involved in gardening.
- To demonstrate the value of gardening in enriching the curriculum, teaching life skills and contributing to children's mental and physical health.
- To convince everyone involved with education in schools of the value of gardening in developing active citizens and carers for the environment.
- To show how gardening can contribute to a sustainable environment.

The Campaign differs from other school gardening initiatives in that it involves providing advice and information on school gardens together with continuing professional development for teachers. Registered schools receive benefits and rewards when they have achieved each of the five levels on the benchmarking scheme, and receive free seeds for their gardens. The overarching aim is to raise the profile of gardens as a natural, sustainable resource that has the capacity to offer curricular, social and emotional benefits to pupils.

One year after the launch of the Campaign, the RHS commissioned the National Foundation for Educational Research (NFER) to evaluate the impact of school gardening on school children's learning and behaviour. At that stage, the Campaign had recruited in excess of 6000 educational institutions, over 80 per cent of which (5050) were primary schools, the key target for the Campaign. NFER's analysis of the RHS database (see Appendix A) suggested that, in its early stages, the Campaign appeared to be particularly successful in engaging high-performing schools and schools in urban and more affluent areas, especially in Yorkshire and the Humber, the South East and the Eastern regions. Even so, the success of special schools and schools with a high percentage (more than 50 per cent) of speakers of a first language other than English (EAL learners) in achieving the highest levels in the benchmarking exercise (levels 4 and 5) was an encouraging sign that the Campaign itself was inclusive and had the capacity to enable all types of school to participate fully in getting children involved in gardening.

In April 2010 the Campaign had registered 11,500 members, and is approaching its aim of enrolling 80 per cent of all primary schools in the UK. At this stage, therefore, the research project investigated the extent to which the Campaign had succeeded in meeting its other aims of enriching the curriculum and contributing to children's mental and physical health. Has the strategy of information, advice, resources and teacher development led to enhanced learning outcomes for children? What other outcomes (for children, teachers and the wider community) appear to be associated with introducing the Campaign? What can we learn to improve the Campaign for the future?

1.2. The research study

Given the varied backgrounds of the schools (some of which had been involved in gardening for some time and some of which were relatively new to the process) the nature of the activities that would be undertaken in schools (which could be confined to a single subject area and teacher or teaching assistant (TA) or which could encompass an integrated cross-curricular approach) and the nature of the RHS campaign (a voluntary programme with broadly defined aims for schools or pupils), it was decided to focus on a largely qualitative study, informed by quantitative data from the RHS and from schools themselves.

The research was conducted in two phases, described in more detail in Appendix A. During the first phase, a desk study, the team analysed data available on the RHS website on schools participating in the Campaign. It looked not only at the extent of penetration of the Campaign and the level of success achieved by participating schools, but at the attainment levels and deprivation indices of participating schools. A detailed report of the findings was submitted to the RHS in spring 2009 and was used to review and augment monitoring activities and, more importantly, to inform their strategy for targeting and supporting schools using the Campaign.

The second phase of the study was based on a two stage case-study approach to a representative sample of ten schools participating in the Campaign. This report draws primarily on the key findings from these visits, which took place between June and November 2009. This part of the research involved looking closely at what schools were doing and the impact that the Campaign had on their activities (reported in Chapter 2), the wider learning outcomes for children, exploring the impact on cognitive, affective, behavioural, physical and social and interpersonal outcomes

(Chapter 3), and the impact that the Campaign has had on children's outcomes under the Every Child Matters (ECM) and community cohesion agendas (Chapter 4). The ECM agenda states that children and young people should be healthy, stay safe, enjoy and achieve, make a positive contribution and achieve economic well-being; the community cohesion agenda is related to schools' duty to promote positive community relations. The final chapter offers reflections on the findings and recommendations arising from the research. Appendix A at the end of the report provides a more detailed methodology.

1.3. The case-study schools

School One is a medium-sized infant and junior school that is located in an urban environment in the East Midlands. It has a lower than average number of pupils that are entitled to free school meals[5] and that have special educational needs[6]. School examination results have been improving over the last three years, and in 2009 78% of pupils achieved key stage two level 4 in English, 91% in maths and 100% in science. This school has a full range of extended services, has been awarded the Healthy School mark and has the silver award for eco-schools. It has large grounds that include a wildlife area, a pond, two greenhouses and a number of different areas for growing vegetables, and has achieved the RHS benchmark level 3.

School Two is a medium-sized school that is located in a semi-rural area in the South West. Almost all pupils are from white British backgrounds and very few speak English as an additional language.[7] The proportion of pupils with special educational needs is close to the national average, as is the proportion of pupils eligible for free school meals. Attainment levels are broadly in line with the national average,[8] and Ofsted commented that pupils 'have a good awareness of the importance of a healthy lifestyle'. The school has achieved the eco-school bronze award, and has large grounds that include a playground, a field, large vegetable plots, an orchard and a butterfly garden, and has achieved the RHS benchmark level 5.

School Three is a medium-sized school found in a rural part of the South-West. It is a high-achieving school, with pupil key stage two attainment above national and local averages, and was graded 'outstanding' in its latest Ofsted report. The school has

5 The mean number of school pupils in England eligible for Free School Meals was 15.5% in 2008/09.
6 The mean number of pupils with a statement of special educational needs (SEN) was 2.8 in 2008/09.
7 The mean number of speakers of a first language other than English (EAL) was 13.5% in 2008/09.
8 71.8% of all primary school pupils in England achieved level 4 or above in 2008/09.

relatively few pupils entitled to free school meals. It has the Healthy School mark, an Active Mark and is planning to become an eco-school. It has large grounds that include a forest school area, a trim trail, a courtyard garden, an orchard and different areas for growing flowers and vegetables, and has achieved the RHS benchmark level 5.

School Four is a large primary that is situated in a challenging urban area in the South East. It has a high proportion of pupils eligible for free school meals and a high proportion of pupils identified as having special educational needs. Key stage test results have improved to above average, and pupils were described in the latest Ofsted report as having 'outstanding personal development'. The school has achieved the Healthy Schools award and the Sports Active Mark, and is working to become an eco-school. The school site is limited in area and largely covered by tarmac, and the school's gardening activities take place in the allotment that is about three-quarters of a mile away. The school has achieved the RHS benchmark level 5.

School Five is an urban inner-city school situated in a challenging area in a London Borough. It is above average size, has a socially and ethnically diverse school population and a relatively high turnover of pupils joining and leaving the school during the course of the year. A high proportion of pupils are eligible for free school meals and a relatively high proportion of pupils have English as an additional language. Key stage two attainment levels are below the national average, and Ofsted has commented that the school is 'making good improvements in important areas'. The school has achieved the Healthy Schools Status, the eco-schools silver award, is working towards becoming a 'green flag' school, and was runner up in last year's EDF eco-school of the year competition. It has an allotment plot in the grounds with tubs and beds planted up around the site; the school has won the Lewisham in Bloom 'Best in Show' Award 2009 and achieved the RHS benchmark level 5.

School Six is a very small village primary school, situated in a sparsely-populated area Yorkshire and the Humber. The majority of pupils are white British and have English as their first language, and a minority have English as an additional language. A high proportion of pupils have special educational needs, and a low proportion are eligible for free school meals. Key stage two attainment is above average, and Ofsted reported that it is 'a truly inclusive school; no matter the ability or background of the pupils, all succeed extremely well'. The school has achieved the Healthy School award. It has limited grounds that are used imaginatively to maximise the amount of area for growing plants, and has reached the RHS benchmark level 2.

School Seven is a medium-sized infant and junior school situated in an urban area in the West Midlands. The majority of pupils are from white British backgrounds and the proportion that is eligible for free school meals is around that of the national average. Attainment in the school is low but rates of progress are increasing and, according to the latest Ofsted report, 'pupils' progress and their quality of learning are steadily strengthening'. Ofsted also noted that 'pupils praise the effectiveness of the school council's campaign to promote healthy lifestyles'; the school has achieved the eco-school silver award and two green flags. It has large grounds with a vegetable and a fruit garden, a sensory garden, a pond area, a large sports field and a forest school area, and has achieved the RHS benchmark level 3.

School Eight is a large school located in an urban area in the Eastern region. Almost all pupils are of white British origin; a small proportion are eligible for free school meals and a small proportion have special educational needs. Pupils' key stage two attainment is broadly in line with the national average, and Ofsted commented that the school 'provides its pupils with a stimulating and caring learning environment in which children can enjoy an enriched curriculum'. The school has achieved the Healthy Schools award, holds the Activemark award, is an eco-school and a Rights Respecting School. The school site has a playground and a fenced vegetable- and fruit-growing garden as well as a pond and a wildlife area, and has achieved the RHS benchmark level 3.

School Nine is a large school in a multicultural urban area in a London Borough. It has a high proportion of pupils who have English as an additional language, a slightly higher than average proportion of pupils who are eligible for free school meals and a higher than average number of pupils have special educational needs. Key stage two attainment levels are slightly above national levels and, in its latest report, Ofsted commented that 'the ethos of educating the whole child is taken very seriously'. The school has achieved the Healthy Schools and Activemark awards. Gardening generally takes place in an allotment plot that is adjacent to the school grounds, although the school has large grounds that include a sensory garden and an outdoor classroom. The school has achieved the RHS benchmark level 4.

School Ten is a large school that serves a diverse multicultural local community in a London Borough. The school has a relatively high proportion of pupils who speak English as an additional language, an above average proportion of pupils with special educational needs and a high proportion of pupils who are eligible for free school meals. Pupils' key stage two attainment levels are above local and national averages,

and Ofsted reported that ‘pupils are happy, make good progress and work cooperatively together’. The school has achieved the Healthy School award and is currently in the process of becoming an accredited Forest School and an eco-school. It has large grounds that incorporate a pond, a forest school area, a vegetable garden and planted borders, and has achieved the RHS benchmark level 2.

2. Gardens in Practice

The RHS Campaign does not make claim to be the first (or even the only) campaign to focus on school gardens, although its emphasis on professional development for teachers and school staff is a distinguishing feature. This means, however, that the Campaign was not starting from a point where nothing had been done in school gardens - all of the ten case-study schools had done some gardening work prior to the launch of the Campaign in 2007. This chapter examines what schools had been doing before their involvement in the Campaign and explores the impact that the Campaign has had on the ways that they have organised and managed their gardens. It sets out the context within which the selected primary schools were working, highlighting the barriers and challenges they faced and the ways these in which they have been overcome – and the role that the Campaign has played in enabling them to do so.

2.1 The starting point

The ten case-study gardens were located in a variety of settings and had different amounts of land available for garden use. Some had large grounds within which there was space for play areas, sports fields, flower beds, fruit and vegetable beds and orchards, while other schools were located in far more restricted sites, often with no grassed-over areas that could be converted to garden use. Interestingly, the amount of space was not necessarily related to the school's location; one small village school, for instance, had similar physical limitations to a large inner city school, while the school with one of the largest grounds was located in an urban area.

The lack of available grounds, however, appeared to present no barrier to gardening, and we saw imaginative and innovative use of space. Indeed, two of the three case-study schools that had achieved benchmark level five were urban schools with relatively limited grounds, and one of these had their main gardening activity in an allotment approximately three-quarters of a mile away from the school site.

The impetus for starting and/or using the school garden had come, typically, from one or two members of staff who were usually experienced gardeners themselves and who

had gained the support of their headteacher to start a gardening club. This procedure was not always the case, however; in one urban school, the gardening lead (who was also Head of Early Years and committed to outdoor learning) encouraged Year 5 teachers to embed the garden into one particular topic area so that the garden could be re-designed and developed for whole school use. Another school, in which there was no experienced gardener among the staff, began the garden with the help of a grandparent, who has continued to provide advice and support over a number of years. The one point that all schools made in this context, however, was that the support of the headteacher was critical if the garden was to become a successful part of school life.

All ten schools said they had limited funding for gardening, and some schools had budgetary problems that meant resources for gardening were highly restricted. Once again, we found that these constraints proved to be no barrier to gardening *per se*, although it meant that progress in establishing and developing work in the garden was slower than it might have been had funds been available. In all cases, school funding was supplemented by fund-raising, by donations from local businesses, by the physical and material contributions of staff, parents and members of the local community and, in some cases, by prizes won in competitions. Each of the schools reported tapping into funding streams available from a range of different sources, including collecting supermarket vouchers for tools and seeds. Many used 'Freecycle' to source specific items and, in one case, the gardening lead had approached the organisation 'London Better Together' for practical help with developing the gardening area.

> One school involved pupils, staff and the local community in collecting materials for/constructing a bottle greenhouse for a total cost of **£16**

2.2 Managing the school garden

All our interviewees commented that gardens involved *'a lot of hard work'*. This not only involved the physical labour of developing and maintaining the site, but also the time and effort needed to plan activities, to gather resources (including funding) and to encourage school community participation, as well as undertaking the gardening activities themselves. As several interviewees pointed out, any gardening work took place within the context of busy schools that are under pressure in terms of targets related to national testing, to inspections and, often, to budgetary constraints. In

practice this meant that the majority of the planning, as well as the physical work, was undertaken by unpaid labour (such as by parents) or by school staff outside school hours, either through gardening clubs or during weekends and days off.

This context is important for understanding how gardens are viewed and managed within each school, as it gave rise to a number of issues. One was managing the delicate balance between fostering the enthusiasm of staff who were willing to work unpaid hours and over-burdening them with expectations so that running the garden became unsustainable. Another concerned succession planning; several of the case-study garden leads were close to retirement, and the task of finding replacement staff who had the expertise, confidence and time to undertake the task of managing the garden was regarded as potentially problematic. A final challenge came from trying to promote garden use among other school staff, particularly in larger schools or in cases where the gardening lead was a teaching assistant (TA) and was perceived as having too little authority to do more than suggest gardening activities to teaching staff.

Nonetheless schools reported ways in which they attempted to overcome these potential barriers, with each suiting their own individual circumstances (though in some cases, this meant ensuring that the gardening activity remained a relatively small part of the school's offer). Both strategic and practical, operational responses were identified. On a **strategic** level, schools had:

- embedded the garden within the school development plan
- ensured that staff members were given specific garden-related tasks
- employed teaching and support staff for whom outdoor learning was a priority
- provided staff with non-contact time in which to plan gardening activities and to develop expertise among other staff members.

On a **practical** level, schools had:

- raised money to install labour-saving devices such as stand-pipes to assist with watering in the summer
- agreed with the extended schools provision that they would care for the garden in the summer months in return for the fruit and vegetables that were grown
- organised parents and carers to undertake specific tasks such as digging, tree planting or weeding small and delicate plants.

In one case-study school, the gardening lead had been employed specifically as a learning mentor. His designated role was to mentor a number of pupils in the school

who had emotional and behavioural problems and to find ways of delivering the curriculum to them outside the normal classroom setting. He combined this mentoring role with his own interest in gardening and, together with his pupils, created a school allotment from a communal tipping-ground and turned it into a highly productive area. This innovative approach to managing the garden by combining it with curricular work for disruptive pupils was not seen elsewhere in the case-study schools, but may be a strategy that has been (or could be) used in other schools.

2.3 The RHS Campaign for School Gardening

Although gardening was a relatively recent activity in most of the case-study schools, all had used their gardens before joining the RHS Campaign. The Campaign was not, therefore, the catalyst for starting a garden, but rather was discovered and used as a resource once the activities had begun; it was frequently described as something that was *'totally in keeping'* with the work that they were already undertaking. Several interviewees were already RHS members and found out about the Campaign in this way, while others had family members who informed them. A few schools reported that they *'just stumbled across'* the Campaign on the internet.

As we have noted, a critical element of the Campaign was the continuing professional development (CPD) that the RHS offered to school staff. A number of interviewees reported enthusiastically about the courses that they had attended, whether as free twilight sessions or as sessions funded by their schools or received as a prize from the Campaign. The training was described as *'practical and do-able'*, the educators as *'inspirational'*, and sessions were seen as a valuable opportunity to share ideas with other practitioners. Those schools close to an RHS Garden and able to make pupil visits were also fulsome in their praise for the resident education staff, describing them variously as *'inspirational'*, *'outstanding'* and *'absolutely excellent'*. One school was particularly enthusiastic about the session on planning healthy packed lunches, which was seen as combining pupil enjoyment with the curricular areas of numeracy, healthy eating and growing plants.

> *Our trips to Harlow Carr have been inspirational for everyone concerned. The practical hands-on help has been the most valuable. D… is inspirational, outstanding.*

Interviewees were unanimously enthusiastic in their reception of the Campaign and the kinds of support it offered. Aspects that were seen to work well were:

- Giving focus to work undertaken in the garden:

  It's focused my thoughts. Before we were just kind of doing it ... you wondered what the children were getting from it. But now we have the criteria to work from, we realise what we are doing – and also other things that we're not doing and perhaps ought to. (TA)

- Giving structure to garden organisation:

  The RHS gives good structure. It makes us think about how we can satisfy each of the criteria in the most inventive way and pull in other departments. The benchmark levels are positive, not just hurdles to cross. Now I come to work and think I've got a great job. (TA)

- Maintaining momentum in work with the garden:

  It re-energised us, especially the children. It keeps the momentum going, gives you something to aim for. You know where you're going next. (Teacher)

- Understanding the environment in which schools work:

  It's nice they [RHS] *don't put pressure on you; you can do things in your own time ... they've been very good with correspondence. They get back to us quickly when we submit our evidence ... It's nice to think that the people there are interested in children.* (TA)

- Recognising schools' efforts:

  The RHS awards give everyone a boost. They give an extra dimension and recognition of hard work; they make people strive to do even better, and they give status to the allotment work. (Headteacher)

Between the first and second visits for this research study, three of the ten case-study schools gained higher benchmark levels, with one school gaining two levels over the six month period. All of the schools at the lower levels reported that they intended to continue to work towards gaining higher levels, and the £500 'Alan Titchmarsh' award and the CPD courses were regarded as popular and welcome incentives. On a number of levels, then, the Campaign can be seen to be providing the type of support and development that schools appreciated and were unable to find elsewhere, and it appeared that schools wanted to continue with their participation.

There were, however, a number of aspects of the Campaign that were perceived as working less well, and the following points were made. They concerned:

- Lack of flexibility. Some interviewees felt that the rules for benchmark achievement were too prescriptive (although this may have been an issue of interpretation). The expectation that pupils should complete garden journals was regarded as unrealistic, for example, and a number of schools reported that they no longer labelled their fruit and vegetables when gardening in or near public areas, as this was believed to encourage theft.
- The time involved in preparing and submitting evidence for the higher benchmark levels. In some cases this was seen as a barrier to progression.
- The requirement to involve other members of staff. Most interviewees reported this as the most challenging target in the scheme; as we noted earlier, TAs in particular were regarded as potentially having insufficient authority to gain support from teaching staff.
- Goals to aim for. Some schools that had achieved level five had a 'What now?' feeling, and would like another goal to work towards.

In addition, schools made the following suggestions on the types of support that they would welcome in the future. Some of these are related to the ways in which materials are compiled for use with children and other teachers, some were a plea for still greater recognition of the constraints under which teachers and schools operated and some were suggestions for ways in which the Campaign could be more influential. In relation to materials, interviewees called for:

- Instructions that are short and straightforward, containing information that is immediately interesting to children (such as the size of the largest strawberry) rather than (or alongside) Latin names and historical details.
- Further guidance on such matters as risk assessments.
- Materials that helped children (and staff) to recognise weeds or to identify and grow vegetables commonly used by ethnic minorities, for example.
- Online help with garden problems, such as potato blight.

Interviewees also suggested that the RHS might need to take even greater cognizance of the timetable and other constraints faced by schools. They asked for:

- Recognition that best horticultural practice may not always be possible in schools. Watering plants, for example, is a task that children enjoy but cannot perform early in the morning or late in the afternoon.
- CPD sessions to take place in schools where possible. Schools located some distance from RHS Gardens felt they were unable to justify the cost of attending CPD sessions, and would welcome on-site training from the RHS. It might be possible to build on existing local arrangements of school clusters or families for these sessions, rather than tailoring individual sessions for individual schools (which would be costly for the RHS).

- Education sessions for children delivered in schools. For some schools, day trips to RHS Gardens were seen as prohibitive, both in terms of the time needed (hours of travelling, for example) and resources (both cost of transport and staff time).

A number of staff in the case-study schools felt that the Campaign could have a wider sphere of influence, whether by producing hard copies of materials that might be picked up by teachers not currently engaged in gardening or by sponsoring garden-related rewards for participating pupils. Suggestions included:

- A teachers' resource pack that could be distributed in the school as a way of promoting gardening activity. Few interviewees felt they had the time to consult the website, and they believed that other teachers in their schools who needed to be persuaded of the utility of school gardening would be even less willing to consult the website; a pack was seen as a potentially more effective way of reaching a wider audience.
- RHS-sponsored school trips to Chelsea Flower Show, possibly as a reward for achieving the highest benchmark level.
- RHS encouragement for local schools to link with each other and share best practice, possibly through trips to visit each others' gardens.

In all, it would seem that the RHS Campaign for school gardening has had an impact on the ways in which schools have looked at and used their gardens, enabling them to focus their activities and providing them with goals to aim for and a structure within which to operate. Has the Campaign also had an impact on pupils – or at least enabled schools to make a closer link between gardening and learning and other outcomes for children? Chapters 3 and 4 present findings related to this theme.

3. Learning through gardens

Schools were at varying levels of development in their introduction of gardening into the curriculum. Reflecting this, school staff at all levels suggested different (though sometimes overlapping) aims, some of which related specifically to promoting learning and some of which related more broadly to community engagement. Broadly, these aims can be divided into four categories:

- To provide an arena for different types of learning that complement and enrich the curriculum.
- To provide a discrete area that facilitates pastoral care.
- To provide a focus that encourages parents and the local community to engage with and contribute to the school.

- To provide a source of pride, pleasure and enjoyment for the entire school community.

This chapter examines the perceived learning outcomes of gardening activities, drawing on both perceptual and documented evidence from teachers and pupils in the ten case-study schools. Following the categorisation adopted by Dillon *et al* (2005[9]) in an international review of the impact of outdoor learning, conducted by NFER and Kings College, London, we organised the analyses according to four learning domains. These are:

- Cognitive learning, concerning the acquisition of knowledge, understanding and other academic outcomes.
- Affective learning, which relates to the development of pupil attitudes, values, beliefs and self-perceptions.
- Behavioural and physical learning, involving personal behaviours, physical well-being and physical skills.
- Interpersonal and social learning, which concerns communication, the ability to relate to others and teamwork.

[9] Dillon, J., Morris, M. O'Donnell, L., Reid, A., Rickinson, M. and Scott, W. (2005) *Engaging and Learning with the Outdoors: the Final Report of the Outdoor Classroom in Rural Context Action Research Project*, Slough: NFER.

This type of categorisation provides a framework that allows careful examination of the different types of impact of garden-related activity on pupils' learning and behaviour, and allows us to explore the relationship between the different types of learning. It is worth noting, however, that such categorisation is not necessarily straightforward; it is not always easy to distinguish between the cognitive and the affective domain, for example, and the causal relationship between activities and outcomes is difficult to identify with certainty (Dillon *et al* 2005, p.23). The findings relating to the four learning domains are presented below.

3.1 Cognitive outcomes

Teachers reported that working in the garden gave them an arena in which they could encourage pupils to become active and independent learners. According to interviewees, the experiences afforded by taking the pupils outside and encouraging them to undertake investigative work involves a different kind of pedagogy in which pupils take greater control over their own learning and in which the teacher's role becomes more facilitative. The cognitive learning outcomes from such work were reported as including greater scientific knowledge and understanding, using scientific techniques, enhanced literacy and numeracy and the use of a wider vocabulary across all areas of the curriculum. Some of this learning appeared to be linked specifically to gardening and the garden, while other learning related more to being outdoors and being able to engage in physical activities that were not possible in the confines of the classroom.

> *I like looking at the roots, how many roots and counting and seeing what sort of plants they are*

It is worth noting that we were talking, in the main, to teachers who were enthusiastic converts to using the garden as part of their teaching, and that they were telling us about their particular success stories; taking children outside into the garden was something that not all staff felt confident about or wanted to do. Teachers who were engaged in this type of learning found that they experimented with different approaches, adapting to the new learning arena as they went along, and that some lessons were more successful than others. Similarly, although some children were clearly engaged by this type of learning, not all enjoyed going outside (we heard examples of

> [Beetles] *aren't real on the whiteboard. You can actually see how it moves and how it lives* [in the garden]

pupils who stayed away on the day that a lesson in the garden had been planned) and not all found this type of learning to their taste. Despite these caveats, we found many examples of positive outcomes for learners.

Teachers were able to identify cognitive outcomes in **science** across a variety of contexts that were not necessarily directly related to the physical act of gardening. They identified cases in which, through garden-related activities, children were able to demonstrate an understanding of scientific concepts (such as taxonomy), scientific methods (including devising experiments), scientific knowledge (including habitats and life-cycles) and appropriate scientific language. The range of strategies teachers used were broader than was possible in a classroom and involved children moving about, touching, feeling, exploring and observing for themselves. This type of work *'brings learning alive'* (Teaching Assistant) in a way that pupils clearly enjoyed.

Examples of such garden-related scientific activities included:

- a 'Darwin thinking walk' through the school garden and in the allotment, during which pupils had to think of the questions that Darwin may have asked when he had been classifying plants and then thought of ways to collect and classify plant specimens before trying these out (*scientific concepts and language*)
- pupil-devised experiments, with one Year 3 class, for example, encouraged to think about the type of questions that they wanted to ask about plants and then finding the appropriate plant in the garden to carry out the investigation (*scientific method and language*)

  You're not just sitting down inside and learning how to do stuff, you can actually do it

  I'd say from the quality of their work that they're producing [from the garden] *and from the vocabulary that they're using and from the conclusions that they're coming to themselves*, [I can see] *how it's started them thinking ...* (Year 3 teacher).
- making bug houses in the garden that prompted the children to think about the types of environment the different creatures would like, and how to create them when they made the houses (*scientific knowledge and language*)
- measuring the growth of plants such as tomatoes, which encouraged pupils to start to think about how to grow their own plants, the effect of light and water on growth and how different plants are suited to different types of soil (*scientific knowledge*). This in turn encouraged them to ask more questions and to have the confidence to experiment (*scientific method*), as one pupil commented:

  [Being in the garden] *was a good opportunity to try something new ... it's nice to have a little place where you can try something new.*

Gardens proved a fertile ground for **mathematical** thinking for pupils of all ages. Teachers were able to cover many aspects of numeracy, from simple exercises in measurement, counting and sequencing to more complex skills such as estimation and use of graphs. During such exercises, teachers were sometimes alerted to other gaps in pupils' knowledge and understanding of food production and seasonal variation. For example, one maths-related gardening exercise involved Year 2 pupils and older children devising a circle garden planner to show the months of the year and the planting and harvesting activities that would take place in each month. In doing so they were using complex mathematical skills (division and the use of angles within a circle, which was divided into 30 degree intervals). For some pupils, however, this also meant learning for the first time about the sequence of months (about which some had a limited awareness) and the seasonality of food production (a reality cloaked by the year-round availability of produce in supermarkets). Older children used the garden for more applied numeracy projects, with one Year 6 group, in the course of one week, measuring trees, identifying leaves and measuring their area, classifying their data and presenting it. Learning outcomes included an understanding of how to collect and collate data, how to present data usefully and how to evaluate and refine their own methods of data collection and classification.

Teachers told us a range of garden-related **literacy** activities, from reading stories and seed packets, through different types of writing such as instructional, non-chronological reports and letters (including letters to the RHS) to imaginative literacy work, inspired by the garden, which was produced by pupils. These included riddles and poems, some of which were entered into poetry competitions.

> *I'm black and gold. I'm fast when I run. I have lots of webs. What am I?*

Other teachers described lessons where the fact of being outdoors, rather than specifically involved in garden activities contributed to literacy development. One teacher described an outdoor lesson in Kung Fu punctuation (where children adopt a particular position for each punctuation mark, making the appropriate 'Kung Fu' noise as they do so) that could have been disruptive in a classroom. Being outside was not just a substitute for work in a large classroom or hall, however. Teachers often commented on how conversation *'just flows'* in a garden in a way that it does not in the classroom, as children become absorbed in what they are doing and lose some of the inhibitions that they may feel indoors. One school with a relatively high number of EAL pupils reported that this effect was particularly noticeable with children who

have English as a second language. This **oracy** outcome was also evident on other topic areas. For instance, there were a number of examples of using the 'Dig for Victory' topic, with children not only creating new gardens in the school grounds and sowing vegetables but also discussing the difficulties of war time as they were digging.

Clearing the allotment, prior to digging and planting, gave one school the opportunity to demonstrate the Great Fire of London in a **history** topic. Using a spare plot, the children constructed houses, lit the first house and watched as the wind blew the fire to the neighbouring houses, matching the progress of the Great Fire itself. Other schools used the garden to facilitate discussions of what Greeks, Romans and Aztecs grew and ate, with one school growing courgettes, tomatoes and herbs in order to make a Roman meal at the end of term.

The garden can therefore be seen to provide an arena for a deeper learning experience than in the classroom, and to provide an arena where they can respond to this type of pedagogy. Part of this is related to the immediacy and applicability of the topic in hand *(what kind of roots? how many beans?)* and part of it is related to being given the opportunity to be participants in decision-making and becoming independent learners.

3.2 Affective outcomes

The impact of gardening on the affective domains (pupil attitudes, values, beliefs and self-perceptions) was most evident in relation to enhanced self-esteem and motivation. Although this was described in many different ways, the general feeling was summed up when a gardening lead described the garden as *'a real leveller…'*. None of the teacher or parent interviewees expressed any reservations in relation to the role of the garden in this part of children's development. Indeed, work in the garden was frequently reported as an instrument to improve children's self-esteem, particularly for those who lacked confidence and self-belief.

I feel happier after being in the garden

This confidence-building through work in the garden was seen in a number of ways. Some children learned to overcome their fear of touching worms or beetles, and to

enjoy getting dirty; others discovered the virtue of patience as they waited for crops to be harvested; others simply enjoyed being outside and watching things grow. The following quotation from a teacher shows how important the garden can be to some children as a way of building **resilience** to protect against life's potential misfortunes:

> *It's like building up a set of poker chips; every time you have a positive experience you get another poker chip. The more you get, the better your self-esteem is, so the knocks are more likely to bounce off you. If you don't get the opportunity to build up that stack of positive experiences, you're constantly going to feel negative. Gardening is a positive experience* [that's] *non-threatening, enjoyable, sociable. And they* ***learn*** *outside as well.*

Resilience was sometimes needed – and not only when crops failed. In one school, for example, we were told a story of pupils' responses when vandals came into the school grounds and destroyed the flower beds that the class had created. The pupils simply set to and replanted the beds.

Improved **confidence and self-esteem** was also seen as an outcome of being able to contribute (and being seen to be able to contribute), through the garden, to the school and wider community. This was demonstrated in a number of different ways. As a result of the public celebration of their garden work in assembly, some previously disruptive pupils were said to feel better about themselves and to have become less unruly. Pupils reported feeling proud of their garden and taking pleasure in the bright colours of the plants, and teachers frequently observed that children liked to show off the work they have done in the garden:

I just adore gardening. I love watching stuff grow

> *When I'm out on playground duty ... they want me to come and see a bit of the garden they've been working on, just to show me what they've done. It's nice to know they value it; they are very proud of it.*

Teachers reported that this pride, in turn, meant that children were more likely to maintain the good condition of the school grounds. In one school we were told about the ways pupils in the garden club defended their work in the garden, ensuring that other pupils did not tread on the crops or eat the fruit. Taking this kind of positive action requires self-assurance and, in this instance, the garden was seen as giving

children the necessary confidence to defend the work they had been doing and to tell others that their potentially destructive actions were wrong.

Teachers felt that the garden had this positive impact because it created a **calm environment** for both pupils and teachers:

> *I feel more relaxed as well. And you just feel like you're not on that constant, minute-by-minute, this-is-what-we-need-to-be-doing thing ...*

> *Having a garden has made us happier because we're not always in the classroom. It's made the teachers happier as well ... When you're out there you feel like you won't get told off if you say something. In the classroom you might be scared to say something in case it was silly.*

A teacher who was also involved in the Forest School initiative was more specific, arguing that, in the school garden, the classroom pressures of completing tasks on time or of ensuring that writing was neat were less obvious; the extra space meant that children had freedom to move around, while the comparative informality encouraged discussion. Another teacher remarked that the garden was removed from the flashing images of computers and the busyness of the classroom, and therefore gave the pupils more opportunity to be quiet and reflective. This can be seen in the following quotation from one pupil, for whom the garden provided:

> *A chance to get away from everyone in the classroom. They're all noisy and they ain't listening and they start shouting. And then some of us get in trouble and it's not even us; people wind you up.*

He then reported that, because he was calmer in the garden than in the classroom, he was able to learn more effectively:

> *We did a science lesson out here and it was much better. We learned about broad beans, how they grow, what they look like on the outside, and then you open them up and see all the broad beans.*

A word frequently used by teaching staff in relation to garden activities was **'enjoyment'**, and the pleasure afforded by this type of work was thought to help children to achieve something that they tended to find difficult. One Year 6 teacher, for example, told us how the garden provided reluctant writers with something meaningful to describe, and then recounted the story of one such pupil with Special Educational Needs (SEN) who was motivated to write a letter about working in the

garden, harvesting the vegetables and then cooking and eating them. Another Year 2 teacher discussed one child who was going through a particularly difficult time, both emotionally and academically:

> *I was asking him one morning about all the things going on in the allotment* [and] *he could answer everything. It was great for me to see someone who could easily become disaffected be so enthusiastic and enthralled about something ... Even that one aspect makes the allotment worthwhile.*

3.3 Behavioural/physical outcomes

Schools reported that the garden is a particularly appropriate place in which to gain new physical skills and to learn about healthy eating and sustainable living so that there was a behavioural change in relation to eating food. Almost all had stories to tell of individual children whose behaviour had been greatly influenced (for the better) by the garden.

★★★★★★★★★★
We're more interested in vegetables. We used to eat a lot of sweets
★★★★★★★★★★

The new skills that children learned in the garden were related not only to the **physical tasks** such as digging, weeding and hoeing, but also to developing the **fine motor skills** needed for such tasks as transplanting tiny seedlings and tying tomatoes to canes. Teachers reported that pupils had to learn to be careful around the plants, and to learn the type of behaviour that was appropriate when around potentially dangerous chemicals and sharp instruments. They also had to show self-restraint when crops were successful; they were not allowed to help themselves to a crop of strawberries in one school, for example, because they had been grown for the whole school community rather than for the personal reward of a few individuals.

One particular outcome noted by most schools was children's **willingness to try new vegetables** such as cabbage, marrow and courgettes. This was believed to be because the pupils were involved in growing the plants and often in cooking the result. One gardening lead cooked vegetables from the garden every week with a small group of pupils, with the rest of the class – and often

the headteacher and anybody else who happened to be near – trying the food when it was ready. This sense of celebration added to the occasion and increased the pupils' willingness to experiment, and the transformation in children's attitude to food was described as a '*sea change*' by the headteacher as a result of growing vegetables in the garden.

Teachers reported that the pupils had to learn a **sense of responsibility** when they were working in the garden. Some schools had rules for garden behaviour that were created and agreed by the gardeners themselves, reflecting again the democratic and co-operative nature of much of the work we saw in school gardens. Schools with extended grounds sometimes devised a system of trust; pupils were trusted to behave sensibly when they were out of the sight of the teacher, to carry on with their tasks and to report when they had finished. Those who broke that trust had to return indoors, and then to prove that they could behave appropriately when they were allowed to return.

> *We are more sensible outside because we're being trusted with our freedom. If you do something bad, you'll get a warning and then another warning, and then you'll get sent back inside because that trust is taken away*

One behavioural outcome reported by almost every school, however, was the effect that gardening could have on children who were disaffected and/or had severe behavioural problems when based in the classroom. One headteacher described how his school used the garden to **foster positive behaviour** in pupils who had attendance problems and / or who lacked motivation:

> *We've highlighted children we think would benefit from taking on the responsibility of being involved in the garden. These children are perhaps a little bit disillusioned by school or think perhaps that they aren't successful at other things, perhaps have self-esteem issues. We've found that one way [to help] with that is to be involved with gardening in our school. And obviously it's made a huge difference to their lives because ... they've been given a purpose in school.*

Other schools reported individual cases where children's behaviour had been difficult to manage within the classroom but where the garden had provided a focus that enabled them to change their behaviour patterns. In one instance a school that had some boys who were displaying challenging behaviour employed a learning mentor to provide an outdoor curriculum specifically for young people with behavioural difficulties. The learning mentor designed, built and developed the garden *with* the

group of boys over a period of months but saw a *'practically instant'* turnaround in their behaviour, as he reported:

> *Pupils feel 'I now have something I can focus on – this bloke isn't going to make me sit down and write an essay. I'm building, I'm using tools.' It has a certain kudos to it as well: 'I could be special in this school without being the person sat outside the head's office, without being constantly in detention'.*

The headteacher told us how she believed this type of change happened:

> *Most of these boys come with other baggage, which is what is causing them not to be able to focus in the classroom and to display challenging behaviour. When boys have got their hands dirty they talk, they talk and get it off their chest without realising it and possibly without remembering afterwards what they've talked about. But they've gone through that process and they feel lighter because they* ***have*** *talked about it.*

Transferring that confidence and better behaviour into the classroom was not an instant process, and activities in the garden formed only part of the ongoing support and mentoring provided by the school. Nonetheless, both the learning mentor and the class teacher reported that, over the year, the confidence and knowledge that these pupils gained in the allotment has been transferred to the classroom. They found that their scientific knowledge was sometimes better than other pupils in the class, for instance, and this in turn had helped to raise their self-esteem.

Gardening, then, can teach a variety of skills and make a major contribution to young people's lives by providing them with a focus that enables them to change established behaviour patterns and that fosters an interest in and capacity for learning. For most pupils work in the garden was a positive contribution for their overall development, but for a relatively small number of pupils it was seen as critical. The school staff who spoke to us during the course of the case-study visits seemed to believe that gardening was a vitally important part of school life for these pupils, who benefited from the garden to achieve things that they were finding difficult or impossible within the classroom. This very focus on the previously disruptive pupils, however, could give rise to a tension within the school in which some pupils felt that such pupils were being rewarded unfairly. It is also worth noting that the use of the garden alone was not enough to change the lives of the children with complex needs or behavioural issues. The impact of the garden and the extent of this type of behavioural effect depends also on the other types of support that a child receives in the school environment, the amount of time he or she spends in the garden and the extent to

which gardening is embedded within the school ethos; there is no single solution to complex behavioural problems that have been established over a number of years.

3.4 Interpersonal/social outcomes

As we have seen, working in the garden encourages staff and pupils to discuss both gardening and non-gardening related matters, and helps to foster a sense of responsibility in pupils both in terms of protecting the garden environment from damage and in monitoring and taking responsibility for their own behaviour. Teachers also identified more social and interpersonal outcomes of engaging in gardening that related to relationships, both internal and external to the school, through the use of inter-cohort (and sometimes intergenerational) gardening clubs, through activities that fostered team work, empathy and co-operation and through curriculum activities that involved the wider community.

Gardening clubs and activities in the case-study schools tended to include pupils from different age cohorts, so that working in the school garden encouraged pupils to develop informal relationships and to strike up friendships with younger and older pupils they would not meet in the normal run of the school day. This gave children new opportunities and environments for **social interaction** that widened their experience and raised their confidence; as one pupil remarked, *'it does kind of help you make more friends'.*

★★★★★★★★★★
We get to see new people we don't really play with
★★★★★★★★★★

Through the gardening clubs, as well as through wider curriculum activities, schools could identify and **work towards a common goal**. In addition to garden design and growing vegetables for the school kitchen, projects were sometimes on a larger scale, such as building a bottle greenhouse. Several of the case-schools built one of these around the time of the research, and the community endeavour required to collect around 1,500 plastic bottles, clean and prepare them, lay the foundation and then construct the greenhouse was said to have

Gardening is cross-curricular. It helps with every area of learning and it helps all children in early years. From those with limited language and who need physical help to the most able, it covers them all

given pupils a practical sense of working in a team and promoted a sense of the whole community working towards a common goal. The sense of achievement from such an undertaking helped to cultivate further the sense of pride in the school environment, and helped pupils to understand the importance of what one headteacher called:

> *Stickability. You can't come for one week and have four weeks off ... you've chosen to do this ... and we need you to turn up.*

Tasks need to be brought to a close, and the garden needs tending whatever the weather or your own motivation at the time that gardening club begins. In this context, one young man delighted his garden lead by telling her that he *'didn't want to let* [her] *down'* by leaving the gardening club and going to football, and he continued to garden until he left the school.

Staff also reported moments when being in the garden prompted interesting and thought-provoking **empathic conversations** that they believed would not have happened in the classroom. A particularly moving story in this context was when one class went to see the poppies in flower in the garden on Remembrance Day, where they talked about the Second World War and the issues to which it gave rise. This prompted two young girls who had recently arrived from Sri Lanka to share their experience of the war in their home country; a sombre but nonetheless touching first-hand story that, as the teacher commented, had far more impact on the pupils than her describing such events with the aid of a whiteboard.

> Everyone on the allotment that we walk past is willing to stop what they're doing and talk to the children and answer any questions. There's a lot of community feeling you get from the allotment

Finally, schools reported how the use of the school garden encourages **community involvement.** We were told stories of how whole families came for 'Big Dig' days, where the day would be devoted to digging up the garden at either end of the growing season and where everyone would share sandwiches, cakes and coffee. One school organises a 'Dads and Lads' group to encourage fathers to come into the school,

> Me and my mum want to get more stuck into gardening now. We've already done cabbages and cauliflowers, but I want to do more than that

and a headteacher from another school commented that gardening provided a focus for fathers and carers who were uncomfortable with the task of, say, selling cakes at the school fair. Schools that have their gardens in community allotments told us how the other gardeners in the area would always be willing to stop for a chat and to give some advice. Some schools had entered produce at Flower Shows, won prizes and found themselves welcomed into a new community of plant-lovers. All the case-study schools had tapped into the generosity of local people and often had been rewarded by the continuing interest and encouragement of a few key individuals.

One outcome of the growing involvement of children in gardening in schools has been the opportunity for the child to **contribute to the home economy**. Children who have been involved with gardening have been able to take produce home and introduce new ideas and cooking styles to their parents, while sales of home-produced fruit and vegetables from the school grounds provide the opportunity for all parents and carers to try fresh produce. In some cases, children reported to teachers that they are now gardening at home.

While the case-study schools all pointed to the potential of the school garden as a means of engaging parents, most recognised the practical difficulties associated with encouraging parents to come into school and participate in gardening activities. Teachers reported a number of reasons for this; parents and carers are busy, or have little interest in participating in school life, or have had difficult experiences with school as young people themselves. An added challenge in this respect is that some parents have little interest in gardening. Generally most schools found that interesting and engaging parents in garden-related activities takes time, that there tended to be a few core people who would help regularly and a pool of others who would help when requested.

This part of the report has shown how enthusiastic teachers in schools with supportive management can use the garden in imaginative and innovative ways to deliver a range of outcomes. In the next section, we narrow the focus of the report onto curricular issues.

3.5 Embedding the garden into the curriculum

In this section we consider ways in which the school garden can be embedded within the curriculum. At the outset, however, we would comment that schools developed

the work in their gardens at different speeds and levels according to the available enthusiasm, funding, time, energy and expertise, and that there seems to be no universal formula to integrating curricular and gardening work. We would also suggest that it is sometimes difficult to separate the curricular work from the different garden-related activities that take place on a regular basis; for example the gardening club may produce vegetables that can be served from the school kitchen, used in the classroom as part of a 'healthy eating' topic and/or sold to the school community to raise funds – which, in turn, may be regarded as part of the numeracy curriculum or as part of teaching children to manage money.

Schools reported that the particular challenges to embedding the garden into the curriculum arose from generating teacher support and enthusiasm (particularly at senior level), having sufficient time to plan and, following on from that, ensuring that the offer is coherent rather than a series of one-off activities. It was also recognised among some interviewees that the school's priorities lay in areas other than the garden and that, in those schools, their TAs' role was seen to lie primarily with the children in the classroom rather than in the garden.

> *The key is having staff with enthusiasm, staff that see the benefits of the garden and will promote it*

> *I think you could teach every lesson outside if you wanted to and thought about it creatively*

Generating support for the garden was seen as an ongoing project because the garden is an additional element to teachers' workload. Teachers, *'have got to see the educational and social and emotional purpose for it'*, as one headteacher pointed out. This interviewee also commented on the importance of teachers becoming personally engaged with the subject so that they have sufficient knowledge and confidence to take pupils outside into the gardening environment. Some schools were, indeed, finding ways to achieve this, and it was – as the quotation above suggests – generally in schools where work in the garden had been seen to be successful and other teachers had been drawn into using it. Gardening was becoming more integrated into the curriculum in the school (cited in Chapter 2) where the learning mentor had been using it to motivate disruptive pupils, for example, and in another school the headteacher and the TA worked closely together to promote work in the garden. The TA was given a day a week to plan curricular links and activities and, by the time of the second case-study visit in November, felt that:

> *The children had a more uniform experience in the garden, very much related to what they do in class.*

A different approach was seen in some of the case-study schools that were undergoing major changes to their curriculum at the time of the visits, partially in response to the Rose Review of the primary curriculum[10]. These schools were planning to or were in the process of adopting a thematically-based 'creative curriculum', and this was regarded as an ideal opportunity to incorporate gardens more widely into curriculum planning, as one interviewee commented:

> *The creative curriculum is working very well – it's exciting for children, it gets them motivated to learn; it also gives them some ownership of their learning. The garden fits in very well with that ... I go to the teachers when they're doing their planning and say, 'Have you thought about using the allotment for that?' And I make suggestions for what they could do.*
> (SENCO gardening lead)

In addition, part of embedding the garden into the curriculum comes from its integration into school management and such documents as school development plans (SDP). Several case-study schools had included the garden in staff performance management, where appropriate, and others had included it in the school development plan (sometimes specifically mentioning the RHS campaign) under the various headings of sustainability, health living, outdoor learning and community cohesion. In one SDP, for example, under 'Personal development and well-being', there are three relevant points for the academic year 2009/10:

- to continue to use the RHS Campaign for School Gardening planning tool to create the Early Years school garden
- to formalise daily outdoor learning planning for Early Years
- to ensure all Early Years staff fully understand their role and the purpose of being outdoors, with CPD to be offered where necessary.

This shows a clear intention to integrate the garden into the everyday school life of the children in Early Years provision and, implicitly, may lead to that provision being extended in relation to pupils' expectations as they move up through the school.

[10] DCSF (2009) *Independent review of the Primary Curriculum: Final Report.* http://publications.teachernet.gov.uk/eOrderingDownload/Primary_curriculum_Report.pdf

In conclusion, while there are ongoing challenges to embedding the garden in the school curriculum, the evidence from our case-study schools suggests that there may be some key ingredients to doing so. These include:

- The active support of the headteacher, through provision of financial and practical support for the garden.
- An enthusiastic key member of staff, who has the time and authority to drive work in the garden through planning and organising activities and providing resources.
- Providing information to staff members, possibly through meetings, about the types of curricular activity that can be undertaken in the garden and the curricular targets that can be achieved.
- Keeping the tasks manageable, given the available staffing, resources and time; not expecting too much, too quickly.
- Keeping the profile of the garden high through the school. School staff reported the following ways that are used in the case-study schools:

  - celebratory assemblies when the gardeners have received an award (such as winning a prize at the local flower show or an RHS benchmark award)
  - giving pupils (publicised) awards for achievements from the garden as well as for academic progress
  - using the kitchen notice-board to announce which fruit and vegetables have come from the garden in the day's lunch, or, alternatively, one of the serving staff might tell the children at the start of the meal
  - organising well-publicised family garden activities
  - selling plants, whether at the school fair or occasionally at the end of the school day
  - showing parents the garden as part of open days.

4. Every Child Matters

This chapter is concerned with placing the garden-related work in the case-study schools in the context of the Every Child Matters (ECM) agenda[11] and the statutory duty on schools to promote community cohesion,[12] making links to the relevant National Indicators where possible. The ECM agenda aims to provide a rounded approach to the well-being of every child and young person from birth to age 19 in order that they might:

- be healthy
- stay safe
- enjoy and achieve
- make a positive contribution
- achieve economic well-being.

The duty to promote community cohesion is concerned with educating children and young people to live and work in a country that is diverse in terms of culture, religion, ethnicities and social backgrounds. It includes a duty to eliminate lawful racial discrimination and to promote equality of opportunity and good relations between people of different groups[13]. The National Indicators underpin both agendas through providing of a set of 198 desired national outcomes for local authorities, and a set of indicators by which to measure them[14].

These outcomes, which are concerned with the health of the whole child, are more difficult to gauge than learning outcomes. This is partly because each covers a wide number of areas (there are, for instance, nine National Indicators (NI) for the 'be healthy' outcome), and partly because improving children's health and well-being within school is a long – and at times uncertain – process; there are relatively large numbers of pupils in most schools, each of whom has individual circumstances that may or may not support or tally with the school's efforts. Similarly, positive relations between different groups and communities can take time to develop. Nonetheless we found evidence that the work undertaken in the garden can support these agendas in a number of ways.

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11 http://www.dcsf.gov.uk/everychildmatters/about/aims/aims/ (accessed 18.02.10).
12 http://www.teachernet.gov.uk/wholeschool/Communitycohesion/ (accessed 18.02.10).
13 Communities and Local Government (2007) *Guidance on the duty to promote community cohesion*, p.1. http://publications.teachernet.gov.uk/eOrderingDownload/DCSF-00598-2007.pdf (accessed 18.02.10).
14 http://www.communities.gov.uk/documents/localgovernment/pdf/735125.pdf (accessed 19.02.10).

4.1 Be healthy

Teachers reported a clear link between working in the garden and promoting healthy choices and behaviours. This was chiefly because the garden was seen not only as an arena in which to educate children about their own personal health, but also as one that contributed to an environment in which healthy eating and exercising became part of the everyday course of events. This kind of practical, repeated demonstration of attitudes and behaviours by a number of different staff in different contexts was seen as providing a powerful message that complemented and reinforced the more formal part of pupils' education. It also was regarded as encouraging healthy patterns of eating behaviour at a relatively early stage in pupils' lives (contributing to NI 55 and NI 56 related to lowering levels of obesity at reception and in Year 6).

> *I like the way we use the vegetables that we grow for our school dinners. I love the potato salad, and I don't usually like potato salad.*

All schools reported that many children were surprised by learning how and where food grows – that potatoes come out of the earth, for instance – and that increased knowledge and practical experience in this area tended to make them more interested in trying new flavours and recipes. Pupils in one school developed a taste for dishes such as rhubarb crumble and beetroot salad, and the gardeners were requested by the school cooks to increase the supply of both so that the kitchen could keep up with demand. Other schools experimented with different kinds of soup, or picked blackcurrants and made muffins, or tried more exotic recipes such as chard stem gratin or coriander, chilli and carrot patties.

> *When I grow them* [vegetables] *I feel like I should always try it. And when I've grown them I like them better than the shop ones*

Learning about food production and healthy choices could also be embedded in lessons that had, for example, a mathematical focus. One Reception class observed their apple tree through the changing seasons, used the apples for counting and weighing, compared dried fruit with the raw apples and then cooked the apples and ate them. In a similar type of exercise for older children, a group of pupils designed a garden to produce food for healthy lunch boxes during the course of a visit to an RHS garden. Relevant questions for this topic included the area each plant needed to grow satisfactorily and the number of plants that could make a salad. When our researcher visited the school, this group of Year 3 and 4 children told

her that one square metre of land could accommodate one pumpkin, four strawberry plants, four autumn raspberry canes, two rows of beans, 100 rocket plants, '*lots'* of carrots, one fruit tree or six cabbages, a clear indication that the lesson had been absorbed.

This merging of curricular learning with a 'taken-for-granted' message of personal health provided continuous reinforcement of the value of making healthy choices. Other ways in which to strengthen and support this message in our case-study schools came through planting fruit trees and plants to provide snacks for children's break-time and the physical act of walking to the allotment.

The gardens were seen to contribute to more than just the promotion of physical health. Many teachers commented that the garden provided a space in which children could be quiet or reflective, or where they could simply extract themselves from the hurly-burly of the playground when things became difficult (contributing to NI 50, improving the emotional health of children). As they pointed out, not all children are sociable all of the time, and some have specific difficulties with socialising that are not easily accommodated in public, noisy places. One teacher, for example, told us that they had some *'very troubled'* children in the school:

> *... who have some quite severe behavioural problems. They can often become angry and run out of class. The first place we go and look for them is often in the garden, because for them that is some sort of sanctuary. They seem to respond really well to what a garden has to offer ... they get some support from nature somehow.* [It's] *hard to explain, but I think it gives them some safety.*

4.2 Stay safe

Schools were also acutely conscious of providing a safe environment for the children while they were in the school garden or allotment, and we were often told that safeguarding children is *'top of the agenda'*. Measures to maximise pupil safety included triangular-shaped beds in a public allotment for high levels of pupil visibility, ensuring that the office was aware of who was at the (off-site) garden, high-visibility jackets for walking along the road and ascertaining that adult helpers had CRB checks. This latter condition, however, was said to have problems in one school, as it had the effect of discouraging parents from volunteering. Another, related, difficulty was maintaining a balance between encouraging friendly conversation with

fellow allotment holders while discouraging unwelcome approaches; as one teacher remarked, *'we just have to be really aware without being paranoid'*.

In addition to these high level safeguarding issues, schools reported a number of ways in which the garden could contribute positively to children's safety. This was by raising pupils' awareness of the possible dangers that could be associated with gardens and gardening, developing a healthy respect for tools, chemicals and the environment and building an understanding of their safe use.

> The allotment isn't fenced off from the public – there's a road running alongside which people use to access their allotments. The absence of a physical boundary is an important learning experience.

The practical ways in which children were made aware of maintaining their own safety were when handling sharp tools, being around potentially dangerous chemicals and carrying heavy loads. In the cases where the school allotment was in a public area, pupils had to learn appropriate physical and behavioural boundaries; where they should go, to whom they should talk and how to be safe as they walked up the road. They learned, too, how to avoid injury by placing guards such as plastic bottles over the top of canes, and how be cautious around certain types of plant such as fungi. They also learned that an important part of keeping themselves safe was to follow instructions, whether written on slug pellet packets or issued by the teacher. In one instance, a school appointed a pupil health and safety officer (among other appointments) to oversee a project undertaken to develop the school garden and playground.

Implicit within these concerns for children's safety was the expectation that they would take care of each other; to warn other children if something was heavy, or if a plant had sharp prickles, for instance (contributing to NI 69, reducing the number of children experiencing bullying). There was also an expectation that children would learn to recognise, by themselves, something that was potentially unsafe; to undertake their own internal risk assessment when they were around the garden and, through this, to be able to transfer this awareness to other situations.

> *When you walk in our front gate, you see the flowers, and that gives you a really good start to school. It makes you feel good*

4.3 Enjoy and achieve

As we reported in Chapter 3, teachers observed a link between children's enjoyment in working in the garden and their capacity to achieve. This point was succinctly illustrated by one teacher who commented that:

> *For me, the difference* [brought about by the garden] *has been in the enjoyment that is evident for the children. Like I say, when I see them outside it's a different class ... they're all engaged.*

All you need to do is look at the photographs or ask the children. If we were to close the gardening club ... there'd be an uproar

There were other aspects of the garden that children enjoyed, however, that included observing the flowers, the process of growing plants, eating garden produce and being outside. Particular achievements that were reported from the garden included celebrating gardeners' success and helping to generate a belief that the school can be successful (contributing to NI 199, increasing children and young people's satisfaction with parks and play areas).

I like digging, getting dirty. It's about the only time in my whole life when I can get dirty

Teachers reported the garden as providing a source of visible, tangible achievements that all members of the school community could enjoy. Children talked to us about taking pleasure in areas that were planted with brightly-coloured flowers and one school, that had planted a sensory garden for the use of children with special educational needs, found that all children liked to go there for such occasions as story time. Staff spoke of their intention to develop this area so that it has willow tunnels and a water feature, and said that they would like to use the space for outdoor musical instruments – a clear indication that the area is regarded as both useful and enjoyable. Children also spoke of how they liked to be involved in the process of growing fruit and vegetables in the garden and then eating the produce; strawberries were a particular favourite, along with potatoes and *'juicy'* plums picked from the tree and eaten immediately.

Another source of enjoyment came from being outside, particularly on a warm day. Children reported enjoying activities such as pond-dipping and making and visiting wildlife habitats; in one school children had PE and then a lesson in the garden, with one pupil reporting:

I really like it because you don't have to, like, sit in class all the time and you're doing stuff that you enjoy. ... it makes you feel refreshed and stuff, so you actually want to come back to school on Monday for another Friday.

In all case-study schools, achievements in the garden were celebrated in ways that could range from an article in the school newsletter to being part of a school assembly. In one school, our researcher witnessed a whole-school assembly where children from different year groups came to the front of the hall and explained the different tasks they had undertaken in the garden; how they had dug, planted and weeded, and how they had planted up tubs with compost and bulbs.

> The children love going over to the garden, and they are contributing to the life of the school. They're contributing to the kitchen; they're so proud when they come in with a lettuce they've just pulled up. It's part of the building blocks to making a positive contribution when they are older

In one school, a group of pupils and their learning mentor had established a successful garden in a previously neglected area. The learning mentor reported that their achievement had boosted morale in the school, and helped both pupils and parents believe that the school, which had relatively low attainment levels, *'can be the best in the borough'*.

4.3 Make a positive contribution

Schools reported a number of different areas in which the garden could help children to make a positive contribution. These included physical contributions, such as creating a garden and producing food for the kitchen, and promoting different types of active citizenship; pupils also learned to play a part in making decisions that can improve their school environment (contributing to NI 110, increasing young people's participation in positive activities).

One recurring theme in our case-study visits was that all children could be involved in the garden; teachers told us that all pupils, regardless of age or ability, were able to make some kind of contribution, whether it was watering the plants, helping to dig or transplanting seedlings. For their part, children reported that they enjoyed the fact that *'everyone's taking part'* in contributing to the garden. In one school, a young man developed a skill for building through his work in the garden, and was able to

understand the instructions on how to construct a shed when his learning mentor had difficulties in interpreting them. The pupil then went on to put up the shed; he also made a barbeque for a parent who had helped in the school in recognition of her efforts.

Most case-study schools fostered a practical understanding of active citizenship through work in the garden. Some encouraged democratic processes through such means as encouraging the gardening club pupils to decide on the types of plants that should be grown or where they should be positioned. In one school the idea of starting a garden was first mooted in the school council, while in another the kitchen staff and pupils regularly discussed which the vegetables to grow for school lunches. The garden was also reported as a site for volunteering, with children asking if they can help staff with the garden at lunchtime or break-time, when there was enough time for small tasks such as watering or dead-heading flowers. One headteacher spoke at length about how the garden supported the altruistic ethos that he fostered in the school; one particular example was how garden produce was grown for all the school community to share and enjoy.

It's about caring for their environment, making positive decisions, not sitting back and letting everyone else do it

Children also learned to care for the environment through the garden. Schools reported that creating wildlife habitats such as 'minibeast hotels' and ponds, and growing types of flowers and plants that encouraged butterflies and birds, have helped pupils to understand how they can contribute to a diversity of wildlife in their area. Similarly, growing their own produce has raised awareness of sustainability issues related to food miles, while the use of bins to produce compost for the garden has given them an opportunity to understand how recycling works in practice. As one pupil commented,

The garden has helped us make a more sustainable school. We're not using up the world's resources to get something.

4.4 Achieve economic well-being

We're teaching them commerce. They talk about how much seeds [and] seedlings cost, how many will survive, what they can sell them for, how much profit they make and how long that process takes

The principal way in which the school garden has helped pupils achieve economic well-being is related to understanding and

handling money. Some encouraged an early form of entrepreneurialism, while in a few schools pupils learned skills in relation to job applications or the presentation of information that would, potentially, stand them in good stead in the future and might help them avoid becoming NEET (not in employment, education or training – NI 117).

The main activity in this area, however, was selling plants to parents and the local community. One school held a fortnightly 'Town Square', where pupils set up stalls in a similar manner to a town square and sold a variety of products, including garden produce, to raise money for charity and the school. A few had an 'Enterprise Day' when each year group had to make something to sell; in one school a group of Year 4 children decided to plant marigold, cornflower and nasturtium seeds and sell them at 50p per pot – and *'they sold like hot cakes'*. Pupils in another school grew and harvested lavender, made lavender bags and sold them; other children made little potted herb gardens from their own garden which they sold to the school community (plus one researcher). One aim for all this activity was to make the garden cost the school as little as possible, and in most cases the pupils were kept involved with the cost of the garden, the amount raised and how it may be spent.

While several schools talked about the possibility of keeping chickens – in one case to produce eggs to make cakes to sell in the Town Square – only one school actually bought them. This was run as a numeracy project for two pupils, in which they were given a budget, chose what they wanted to buy, ordered the products online and then checked the delivery notes with the order. Selling eggs from the result was seen, in this case, as an economic bonus. Other children managed budgets for their school garden, usually in the gardening club, deciding how it should be spent and taking time over sourcing purchases in order to get the best deal.

Some schools reported using the garden as a means to help children develop skills in communication, presentation and negotiation. One referred to a garden development project; during the development phase, a project team was selected through a process that included writing an application form and then taking part in an interview for a position such as project manager or health and safety officer that lasted for the duration of the project. The second school involved children in writing persuasive letters to the headteacher to outline their case for new developments in the garden and to ask for funding. Another school gave a Year 5 class the task of designing a garden; pupils whose designs were selected as the best then presented their ideas to the gardening lead, who then made the decision as to which design to support.

4.5 Community cohesion

The contribution that school gardens made to the duty to promote community cohesion was reported primarily as improving links with different community groups. This took a variety of forms, from one school giving gourds to the local churches for their harvest festival to another developing mutually beneficial links with a local pensioners' group.

Allotments were regarded as a particularly valuable place in which to forge links with other people and communities. In one case a school was invited to have an allotment because the leader saw that few allotment holders lived locally and he wanted to strengthen the gardening community; strong links have now been built up and several people now come in to help in the school as a result. The school is now well-known at the allotment and the school has become well-respected for children's behaviour when they are there and for the way that they care for their plot. Another school forged strong links with a pensioner's club and developed a mutually satisfactory relationship where each was able to help the other; the school donated their vegetables to the pensioners during the summer holidays and the pensioners provided expertise for the school's knitting and sewing club in the following autumn term. Another school has a similar relationship with the local council, wherein pupils carry out litter picking in the local parks and receive wood chip for their garden paths in return.

One school has become something of a celebrity within the local community because of the bottle greenhouse that they built; it has aroused a lot of local interest, and it was reported that people came to visit the allotment especially to see it. The children enjoyed sharing their work with others and staff felt that the school's local reputation had benefited.

> Children say it's nice to be able to meet and chat to the older people on the allotments; they are granddad type figures that some of them don't have. It bridges the gap between old and young, and they've developed good relationships

The knock on impact of school gardening was mentioned in another school where parent volunteers, inspired by their work on the school allotment, had taken on allotments or started gardens at home themselves, widening and strengthening both the allotment community and the school contribution; all have donated spare seedlings and plants to the school when they can. Digging days on occasional Sundays appeared to have led to an

increase in contact with fathers, some of whom had not been involved in any other part of school life.

4.6 In summary

School gardens have proved to be a source not only of learning outcomes for pupils, but also for other wider outcomes around both the Every Child Matters agenda and the wider duty of community cohesion. Schools had used the gardens to promote the development of active citizens as well as independent learners and had observed changes not only in the children, but in attitudes to the school within the local community. The implications of these findings for future curriculum and school development are explored in Chapter 5.

5. Reflections and recommendations

The preceding chapters have explored both the impact of gardening on learning and other outcomes for children (and their families and teachers) and the wider impact of the RHS Campaign for Gardening on primary schools. This chapter provides a reflective overview review of the findings and looks at ways that schools, local authorities, Primary Care Trusts (PCTs) and others could use gardening as a means not only of enhancing learning, but of promoting better outcomes related to, for example, health, safety and community cohesion. It concludes with some recommendations for the future development of the RHS Campaign.

5.1. For Primary Care Trusts, the School Food Trust and CAMHS

Under Public Service Agreement (PSA) Delivery Agreement 12, there is a particular focus on increasing the percentage of pupils who have school lunches, reducing the proportion of overweight and obese children and improving children's emotional well-being[15]. In 2007/08, for example, 9.9 per cent of young children in reception classes and 17.5 per cent of those in Year 6 were identified as obese. These figures (ranging from one tenth to one fifth of the cohort) are both startling and worrying, with a concomitant rise in diabetes and other health issues also evident in many local authorities.

PCTs, the School Food Trust and the Child and Adolescent Mental Health Services (CAMHS) have all been given the task of reducing the incidence of such ill health. Indications from the ten case-study schools suggest that effective use of school gardens could be particularly helpful in supporting their work. The research found evidence of improvements in eating patterns, with a greater willingness amongst children to try new things and to eat a wider range of fresh vegetables and fruit – a willingness that extended into their lives outside school. It saw examples of physical activity outside participation in traditional sports and encountered a number of instances where the garden was regarded as a sanctuary and safe place for troubled children and as a means of developing and fostering emotional resilience.

Engaging with schools – and school gardens – could therefore contribute to:

[15] HMSO (2007). *PSA Delivery Agreement 12: Improve the health and wellbeing of children and young people*. HMSO: Norwich.

- Improving the emotional health of children (National Indicator 50 – NI 50).
- Reducing obesity amongst children of primary school age in reception classes (NI 55) and Year 6 (NI 56).
- Increasing the take-up of school lunches (NI 52).

5.2. For Local Authorities

In addition to their oversight of children and young people's education, local authorities have a wider duty of care, with responsibilities for social care and other aspects of children's lives. These duties include the ECM outcomes as well as aspects of the local economy, environmental sustainability and community cohesion. While it is clear how gardening can contribute to the development of a greater awareness of environmental issues and to improved satisfaction with the local environment as a result of actions linked to those issues (improving school grounds, clearing allotments and so forth), its contribution to other aspects of the children's agenda may not always be as obvious. Yet across the ten case-study schools, practical activities have led to the exploration of a range of critical issues, including safeguarding and the development of career-related skills.

In recent years, for example, the need to keep children safe has been brought into profound relief, with Lord Laming, in his report in 2009, calling for a step change in arrangements to keep children from harm[16]. Through engagement in gardening activities, schools have had to explore a range of safety issues, from working with tools and garden chemicals to road safety, but have also had to be aware of safeguarding issues, particularly when working with family members and members of the wider public in allotments and other public spaces.

Gardening has also enabled schools to focus on addressing behavioural issues amongst members of the school community and to develop their social and interaction skills as well as their confidence and self-esteem.

Planning activities associated with garden development have prompted a consideration of the range of different jobs associated with gardening (from physical activity in preparing the soil and planting, to soil science, landscape gardening and architecture) and the widening of children's horizons.

[16] Laming, H. (2009) *The protection of children in England: a progress report* (HC 330), London: TSO (available at http://publications.everychildmatters.gov.uk/eOrderingDownload/HC-330.pdf, accessed 15 March 2010).

As a result of supporting school gardening in the widest sense, therefore, local authorities could promote the achievement of aspects of a number of national indicators and PSA targets. These could include:

- Reduced incidences of bullying amongst children (NI 69).
- Greater participation in positive activities (NI 110).
- Reducing the number of young people who are not in education, employment or training (NI 117).
- Increased satisfaction with parks and play areas (particularly in schools) (linked to NI 199).

5.3. For Schools

The evidence from the ten case-study schools suggests that a significant amount of learning can take place in the garden, encompassing all curriculum areas (such as maths; science; languages; the humanities; personal, social, health and economic education and the arts) and a range of verbal, oral and personal and social skills. Such learning can contribute to the progress across a range of attainment indicators in early years and at key Stage 2 (NIs 72, 73, 76, 92, 93, 94, 107) as well as reducing the gaps in attainment between groups such as those on Free School Meals (NI 102) or those with special educational needs (NI 104). It can also contribute to the various indicators around health (NI 50 and NI 56), school meals (NI 52) and bullying (NI 69). In addition, such engagement can also forge greater community links, drawing in not just families, but wider community and intergenerational groups.

Schools may wish to consider how they could use evidence of garden-related learning, personal and social development and community activities when completing their self-evaluation forms for Ofsted inspections. In particular, schools could draw on evidence from work in the school garden to illustrate learning and other outcomes for pupils and for the school as a whole, including:

- how well pupils enjoy their learning as shown by their interest, enthusiasm and engagement across a range of subjects, and their ability to apply skills appropriate to their age in oracy, literacy and numeracy in real world contexts
- how well pupils develop wider skills and personal qualities such as working in teams, solving problems, organising activities and taking leadership roles and contributing to the school and wider community
- pupils' ability and willingness to manage their own behaviour and their ability to understand, assess and respond to risks

- children's participation in extra-curricular activities and understanding of the benefits of physical exercise and a healthy diet, and how they have adopted these into their lifestyles, including selection of healthy food
- the effectiveness with which the school promotes community cohesion and engages with parents and carers.

5.4. For the RHS and the Campaign for School Gardening

Through the Campaign for School Gardening, the RHS is well placed to support the development of cognitive, affective, behavioural and interpersonal and social learning for children and the personal and professional development of teaching and support staff in schools (through continuing professional development activities and case-study examples - not lesson plans - of ways to use the school gardens more effectively in the curriculum and to meet personal, economic and skill needs). It is also in a position to support the wider agenda for PCTs, local authorities and schools through:

- Developing local or regional networks of schools to share ideas and practice.
- Liaising with key personnel in local authorities, Children's Trusts and PCTs, such as the independent safeguarding lead, the lead adviser for information, advice and guidance (IAG) or staff responsible for community cohesion activities.
- Liaising with key organisations and campaigns such as Eco-schools, Forest Schools and the Healthy Schools Campaign.

In addition, the Campaign may need to think creatively about the ways in which it provides support (extending the range of activities that take place on school sites as well as in RHS gardens, for instance) and encourages sustainability (what the Campaign could do to help schools examine and address staffing issues and succession planning, for example).

5.5. In summary

The RHS Campaign for School Gardening has been successful in recruiting 11,500 primary schools. Its most noteworthy contributions have been the ways in which it has provided a focus and structure for the organisation of (often pre-existing) gardens in schools, facilitating progress and recognising and rewarding their efforts. Schools have particularly welcomed the support and training that the Campaign has made available. The future of the Campaign would be enhanced by enabling schools to look

beyond achieving the current level 5 benchmark (giving schools something more to aim for). It would also be strengthened by making clearer links with the wider development landscape within which schools work – those areas of school life linked to healthy living, child safety, enjoyment, positive activities and career-related learning, for instance – and the onus on them to facilitate community cohesion.

A. Methodological appendix

Following the launch of the Campaign for School Gardening in 2007, the Royal Horticultural Society (RHS) commissioned the National Foundation for Educational Research (NFER) in 2009 to assess the impact of school gardening on children's learning and behaviour. The primary aim of the research was to assess the impact that using a school garden had on primary pupils' learning, behaviour and health and well-being. A secondary aim was to evaluate the impact that the RHS' Campaign for School Gardening had on children's learning and behaviour.

Given the varied backgrounds of the schools (some of which had been involved in gardening for some time and some of which were new to the process) the nature of the activities that would be undertaken in schools (which could be confined to a single subject area and teacher or classroom assistant or which could encompass an integrated cross-curricular approach) and the nature of the RHS campaign (a voluntary programme with broadly defined aims for schools or pupils), it was decided to focus on a largely qualitative study, informed by quantitative data from the RHS and from schools themselves.

The research was conducted in two phases. During the first phase, a desk study, the team analysed data available on the RHS website on schools participating in the Campaign. It looked not only at the extent of penetration of the campaign, but at the attainment levels and deprivation indices of participating schools. The second phase of the study was based on a two stage case-study approach to a representative sample of ten schools participating in the Campaign. The activities in each of these phases is summarised in the following sub-sections.

A.1 Phase 1 Desk study

In May 2009, the RHS dataset comprised 8863 entries. Eighty-seven per cent of these included sufficient information for them to be matched directly to the NFER Register of Schools (ROS), a database of all schools and colleges in the United Kingdom. The results in Appendix Table 1 show that 6235 of the entries were identified as UK schools (including 189 post-compulsory sixth form and further educational colleges). Of the remaining 2628 entries, 43 per cent could not be matched because there was missing data on the RHS dataset, while the remainder were duplicate entries, overseas

schools or organisations other than schools. It is likely that some of the 1149 unmatched entries could be schools, or were duplicates, overseas schools or other organisations, but without further detailed manual analysis, this could not be confirmed within the scope of the current project.

Table 1 Degree of matching

Matched to NFER Register of Schools	6235
Duplicate entries	1278
Overseas schools	37
Organisations other than schools	164
Entries not matched	1149
Total	8863

Source: RHS Campaign for Gardening and NFER Register of Schools

The analysis that was presented to RHS and which is summarised here is therefore based on data from the 6235 educational institutions (this includes 6,046 schools and 189 post-compulsory institutions) for which data is available. As not all institutions provided all the different types of information requested by RHS, the base number for a number of the analyses varied.

A.1.1 Participation in the Campaign

Analysis of the RHS data found that the majority of schools participating in the RHS Campaign for School Gardening were from the primary sector (81 per cent of participating institutions) and that, in England, the greatest proportion were situated in Yorkshire and the Humber, the South East and the Eastern regions. The majority of schools were urban, of medium size (ranging from 189-429 pupils) and, proportionately, tended to be situated in more affluent areas and those areas with fewer health problems or other issues related to deprivation. Schools recruited from the primary sector tended to be high-performing, whilst those in the secondary sector more closely reflected the national profile.

A.1.2 Benchmarking levels reached by schools in the Campaign

Part of the RHS campaign includes a five level benchmarking strategy. The benchmark levels that were recorded against institutions when the data was extracted in May suggests that for many schools, progress to level 2 seems to be relatively straightforward, but that fewer schools made continued progress to levels 3 to 5, with the proportion at these three levels markedly lower than at levels 1 and 2. As the Campaign had been established less than two years by the time the data was analysed

and as the higher levels are designed to be challenging, it is possible that the numbers achieving the higher benchmark levels will rise in the foreseeable future.

It is difficult to draw firm conclusions from the data, partly because, at the time the data was analysed, the Campaign had been running for a relatively short time and the numbers of schools achieving the higher benchmark levels was low. Nonetheless it was possible to discern some emerging patterns. In particular:

- The success of special schools and schools with a high percentage of EAL learners (50+ per cent) in achieving levels 4 and 5 was an encouraging sign that the Campaign was inclusive and enabling all types of school to participate fully.
- The South East, the Eastern region and Yorkshire and the Humber had both relatively high rates of benchmark achievement levels, possibly reflecting higher rates of campaign penetration.
- Larger schools and urban schools were more likely to have reached the higher levels, suggesting that RHS support targeted at smaller schools with more limited resources (often rural schools) might be helpful in promoting benchmark achievement.

The analysis carried out during the desk study contributed to the selection of case-study schools for Phase 2.

A.2 Phase 2 Case studies

A robust sample of **ten schools** was selected for the in-depth case-study research. These schools were selected, using a stratified random sampling approach, based on an initial analysis of the data submitted to the RHS on the characteristics of schools participating in the Campaign. An iterative process of sampling reduced the initial dataset from 6,046 to 25 primary schools. Since the emphasis of the study was on the impact of school gardens on learning, the sample was initially weighted towards those with higher levels of benchmark achievement. These 25 schools were then approached (on a priority basis within each of the five achievement bands) to request their participation in the study and a final sample of ten schools was recruited for in-depth work. This final sample covered seven government office regions and included seven urban and three rural schools (to reflect the balance of schools in the campaign) and was also representative of all size, attainment and deprivation indices. Reflecting benchmark attainment in primary schools, two of the schools had reached level 5 in the benchmarking scheme, three were at levels 3 to 4 and five were at level 2.

During the first phase of school visits, detailed information was sought on schools' use of their garden (including the length of time they had been involved in gardening), and their motivation for becoming involved in the Campaign. During interviews and through observation techniques, the research team also gathered information on the perceived impact of school gardening on children's learning, behaviour and health/well-being. In this first phase of case-study work (conducted in the summer term of 2008/09), interviews were conducted with:

- 11 senior leaders (including headteachers and deputies and one school bursar)
- ten staff seen as the 'garden leads' (these were not all teachers)
- ten other members of the teaching staff and two teaching assistants (one of whom was an HLTA)
- two parent governors and two other parents who helped in the school garden
- 43 pupils.

Schools were given disposable cameras and diaries in which to record activities over the coming months, prior to a second case-study visit during the autumn term of 2009/10. During this second visit, the emphasis was on collecting evidence of the impact of the garden on pupils' cognitive and affective learning, behaviour, social skills and other outcomes as well as exploring the extent to which gardening had been integrated into the school curriculum, into performance management structures and into relationships with the wider community. In this phase of work, interviews were conducted with:

- ten senior leaders (including headteachers and one assistant head)
- ten staff seen as the 'garden leads'
- nine other members of the teaching staff
- three parents, one school governor and a site manager
- 44 pupils (some of whom had been interviewed in stage 1).

www.nfer.ac.uk

National Foundation for Educational Research
The Mere Upton Park
Slough Berks SL1 2DQ
Tel: 01753 574123 Fax: 01753 691632
Email: enquiries@nfer.ac.uk