Learning for sustainability: from the pupils' perspective

A report of a three-year longitudinal study of 15 schools from June 2005 to June 2008

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Acknowledgements

About the author

Dr Chris Gayford gained his PhD in microbial ecology before training as a science teacher; finally becoming a senior teacher and head of science in a comprehensive school in the West Midlands. He then went on to the University of Reading where he has been involved in initial teacher training at both the primary and secondary level at different times as well as contributing to the professional development of teachers. For many years his area of research and particular enthusiasm has been first in environmental education and then education for sustainability, in the latter years using participatory methods and working directly with pupils and teachers in schools.

About WWF

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WWF's education programme was established in the early 1980s, encouraging schools to put sustainability at the heart of school life. WWF's programme provides schools with a range of engaging and inspiring activities which show how all schools can play a part in striving to live within the ecological limits of one planet.

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Overview of the report

This report sets out the aims and purposes of a study of 15 selected schools, all of which were identified for their expressed commitment to learning for sustainability. Some were selected for their involvement with WWF-UK initiatives, particularly *Pathways: A development framework for school sustainability* (WWF 2004[1]) and *Learning for sustainability – Planning a classroom topic on communities and sustainability* (WWF 2005[2]). There follows a summary of the key findings and a series of conclusions. The report is set against a background of interest shown by government departments and other agencies, both statutory and non-statutory. Some details are provided about the sample schools and the methodology used. This is followed by a more extensive and detailed list of the findings and an outline of the suggested progression shown by pupils with regard to their understanding of concepts and the development of related process skills and abilities. The Appendix contains additional information about the sample schools.

Throughout, a broad understanding of the nature of learning for sustainability is assumed (see Section 1.1).

Contents

1   Executive summary

1.1 Introduction, aims and focus

It should be appreciated from the beginning of this report that the schools selected for the study were either already committed to learning for sustainability as an important part of their formal and whole school activities or they had made the decision that it was an important feature of their immediate future plans (see Appendix for a list of the schools and brief descriptions). Therefore the schools involved do not represent a random national sample but instead they are a representative sample of schools where it was expected that good quality learning for sustainability was likely to be found or developed. However, it is also clear that the degree of commitment to this varied considerably in these schools. Some of the schools were in the early stages of developing learning for sustainability, while others had much more comprehensive programmes in place.

The study comes at a time when there have been many important developments that set out wide-ranging ways in which every school should move towards being more sustainable (see for example DFES 2006 [3], often known as The Sustainable Schools Strategy). Many aspects of the strategy are directed generally at schools but some give specific mention of outcomes for the pupils. The type of sustainability that is envisioned in this study is broad and integrates the aims of healthy lifestyles, environmental awareness and involvement with the local community. This interpretation is in line with a broad consensus in the literature about the nature of effective learning for sustainability (see Section 2 of this report).

Much of this is advocated within the context of the school and may involve simple practical measures such as saving energy or water, reducing and recycling waste, improving safety around the school, addressing the problem of bullying, encouraging healthy living and so on. Many schools have policies and practices that are directly concerned with these matters. Schools, via their heads, classroom teachers and others in positions of responsibility, can be questioned about these and a picture will emerge. However, it is important that the pupils' perspective is not neglected, as this can help shape decisions to improve provision. It is worth asking what the pupils are getting out of this and what they make of their experiences. In addition, are there indications of changes over time with regard to these matters – both in terms of particular cohorts of pupils as they progress through their school, and with regard to pupils' experiences in any particular year as the school improves its provision in relation to learning for sustainability? This enquiry has set out to begin to address these types of questions, and is therefore clearly pupil-focused. (For further discussion, see the report on the OECD Environment School Initiative (ENSI Project) 1995[4] and Rickinson, 2001[5], where it is apparent that teachers and pupils are operating from different perspectives on many environmental issues.)

Most people who are strongly motivated towards the promotion of environmental sustainability consider that the development of appropriate attitudes towards the environment is particularly important, rather than simply confining the emphasis to knowledge and understanding, but this raises other difficulties. These have been debated at length in the research literature and relate to disagreement about the nature of these attitudes and also whether they can be reliably assessed. Nevertheless, despite these reservations, it is expected that this research should shed some light on the attitudes of the young people involved in this study and ways in which the development of attitudes can be encouraged.

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1.2 Summary of key findings

An extensive list of the important findings of the study is given in Section 4. Reference is made here to the relevant numbered items in that section.

1. Most of the pupils in the study considered that environmental sustainability is important. This was especially the case among primary school pupils. The attitude of secondary pupils, particularly older ones, to what is considered acceptable behaviour in relation to the environment, was often different and affected more by peer approval and most recently to external social factors – particularly economic pressures. Pupils of all ages showed that they need the school to demonstrate that 'sustainability' is something that it values. (See findings numbers 1, 2, 7, 9 and 47.)

2. Over the period of the study there were improvements both in pupils' knowledge of issues related to sustainability and their relevant abilities and competencies (see Section 3 for a brief explanation of the criteria used to make these judgements). The clearest increases in knowledge were usually linked to an emphasis in the school on sustainability within the curriculum; but more important, as an explicit aspect of the ethos of the school. Most pupils had heard the word 'sustainability' applied to the environment but few could express anything more than a simple personal concept (See numbers 3, 4, 6, 21, 22, 23 and 45.)

3. Standards of achievement, behaviour and attendance in these schools were also generally high relative to standard measures. (See number 5.)

4. Where teachers use activities related to learning for sustainability as a platform for what pupils described as 'preaching' to them, particularly in secondary schools, it was usually considered counterproductive. Innovative approaches to activities with strong pupil involvement in planning and presentation were usually more effective. (See number 8.)

5. The greatest gains were usually found where there was close agreement between the school and the families of pupils about the importance of learning for sustainability, and where these issues are discussed and practised in both environments. Pupils of most ages admitted to the influence of older siblings, or others important to them, on whether they adopted at home the types of behaviour related to sustainability encouraged in school. However, it has recently become more likely that attitudes at home are more strongly influenced by economic factors such as the rise in heating and fuel costs. (See numbers 10, 11 and 46.)

6. School councils can have a valuable motivating effect on pupils' involvement in learning for sustainability. Students of all ages generally considered the school council to be a good thing which provided opportunities for involvement in decision-making within the school. The most successful councils enabled pupils to exercise control over meetings and dissemination of outcomes – usually resulting in tangible, often practical, outcomes achieved over a fairly short time scale. (See numbers 12, 13, 14, 15, 16, 17, 18, 19 and 20.)

7. Where pupils were involved in monitoring, recording and reporting the effectiveness of the measures taken to improve sustainability within the school, or involved in planning changes in the school or local community, there were valuable educational outcomes and increased pupil motivation. (See number 39.)

8. The concept of the 'eight doorways' (food and drink, energy and water, travel and traffic, purchasing and waste, buildings and grounds, inclusion and participation, local well-being, and the global dimension – see DFES 2006[3] Sustainable schools strategy) has been a useful model for a broad interpretation of learning for sustainability. It was also notable that

while biological diversity is not included as one of the doorways, pupils expressed particular concern for this aspect of learning for sustainability. (See numbers 24, 25, 26, 27, 28, 29 and 30.)

9. Healthy lifestyles are a feature of learning for sustainability and most schools contributed well to this understanding. Pupils were well informed about what constitutes a healthy lifestyle and were able to talk about it in some detail. (See numbers 31, 32, 33 and 34.)

10. Pupils appreciated events and activities that interrupt the routine of the school and extend their experience of learning for sustainability. These were particularly effective if they involved enrichment activities or focused events, such as 'Fair Trade Fortnight'. They were especially motivated if these activities provided an opportunity to work with friends; had an element of challenge; and involved pupils in planning and disseminating the outcomes. (See numbers 37 and 38.)

11. Particular focus on 'inclusiveness' was effective, particularly where pupils were given special responsibilities such as acting as peer counsellors, or in primary schools, specific pupils were encouraged to befriend children who are new to the school or who have special needs. In schools where there is considerable ethnic diversity, pupils often explicitly stated that they value this as a particular feature of their school. (See numbers 35 and 36.)

12. Where there were international contacts related to developing countries, initial focus was often on charitable activities. Where the global dimension included improved cultural understanding some pupils understood that they could learn from other cultures, rather than simply considering them as less fortunate. Some pupils had the view that communities worldwide affect each other so that what is done in this country has implications for those elsewhere. Many pupils, even at an early age, had a view of what constitutes fair trade and concern for the exploitation of labour and social justice. (See numbers 40, 41, 42, 43 and 44.)

1.3 Conclusions and implications

It was clear while gathering evidence from the schools for the study that there is a strong link between effective learning for sustainability based on the broad principles of the eight doorways and the general socialisation of children as they progress through the education system.

Below are pupils' suggestions about how learning for sustainability can be enhanced in their schools. Most of these were reinforced many times in different schools.

i)   Make it clear that learning for sustainability is valued within the school

There are many ways in which this can be made apparent and much of it may seem self-evident once pointed out. Notably the Head and others in the Senior Management Team have an important role (see also National College for School Leadership 2007 *Leading sustainable schools: what the research tells us*[6]). This may be simply by explicitly taking an interest and especially by becoming involved and actively promoting learning for sustainability, or by encouraging special activities within the school; also by celebrating activities and achievements that focus on aspects of sustainability. Positive role models enable young people to observe the enthusiasm and success of others and to see the processes others use to achieve their goals and then assess their own competence in comparison. When people are unsure about their own abilities, this vicarious information is a valuable source of reassurance (see Chawla and Flanders Cushing 2007[7]).

The value placed on learning for sustainability can also be demonstrated by ensuring that it is on the agenda for governors and that at least one of the

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governors is encouraged to take an active interest, especially if this is with pupils. Parental involvement in particular schemes and involvement of the local media can also be effective motivators.

ii)   Ensure there is effective communication

Many schools, especially secondary schools, struggle with communication across the whole school community. While small groups of pupils who are particularly enthusiastic about learning for sustainability can act as a stimulus for others to become involved, it is important that activities are communicated widely. Dedicated notice boards that are regularly updated by the pupils themselves seem to be helpful. The use of 'Year Books' or large poster displays help to show what is happening, as well as progress over a period of time and the variety of activities in which pupils have been involved. Also plentiful photographs illustrating the involvement of a large number of pupils add to the interest among both primary and secondary pupils. Celebrating outcomes helps to raise the profile of learning for sustainability and improves pupils' self esteem.

iii)   Give sufficient attention to the 'pupil voice'

The structure of school councils, and to some extent eco-councils, may take many different forms and the degree of pupil control varies. Often the claim by the less involved pupils is that they do not know what is going on. Cynically, this could be interpreted as symptomatic of a wider issue in relation to the 'less engaged' members of the school community. However, discussions with pupils of all ages indicated that they had a positive attitude to the concept of a school council provided that it had the proven potential for greater involvement in decision-making within the school and that the school implemented a significant proportion of the ideas suggested by pupils.

School councils that encourage the 'pupil voice' are the focus of considerable interest and are seen as a way of developing an educational agenda that takes children's rights seriously. There is evidence that the political and social climate is warming towards involving young people in this way. At the same time it should be taken into account that pupils' views on a range of issues that affect the context in which they learn can be a serious challenge to the professionalism of practitioners working in schools.

The most successful school councils enable pupils to feel that they have significant control over the meetings, such as setting agendas and making records of meetings that are efficiently disseminated. Here it is recognised that children need opportunities for collaborative decision-making and setting goals for themselves in everyday life. This enables them to begin to exercise control of their environment and other aspects of their lives and is a core principle of education for democracy. In this way young people gain autonomy, a sense of self-worth, respect for other people's perspectives and negotiation skills.

Also effective school councils are ones where pupils are able to point to recent outcomes. The timescale between decision-making and implementation is important because pupils tend to move on to different institutions after a few years, therefore long delays are usually interpreted as inactivity. Time should be given to feedback to whole classes, delivered by well briefed class representatives following meetings.

(For further information and discussion related to school councils see Kirby et al. 2003[8] *Building a culture of participation; Working together: giving young people a say,* DFES 2003[9]; and Real decision making? School councils in action, a research report for the DCSF 2007, Whitty and Wisby[10]).

iv) Use the curriculum to provide a coherent understanding of sustainability

Integration between what is formally taught in the curriculum and other activities related to learning for sustainability in the school should be carefully planned. In this way pupils are enabled to develop a better rationale and overall appreciation of aspects of sustainability. Time and again pupils point to where they learned about matters such as recycling, saving energy or climate change and relate this to their personal responsibilities in trying to address problems of sustainability. Where there is collaborative planning in order to address particular topics across the curriculum it avoids the risk of pupil boredom due to over-exposure to particular current topics, such as climate change. Primary schools find this much easier to achieve, since they may have a smaller team of teachers working together, and the curriculum lends itself more naturally to this type of integrated approach. (See also Ofsted 2008 *Schools and sustainability: a climate for change*[11]). It is apparent that pessimism can turn to hope when young people are given knowledge about how to act, and when what might be described as 'unfocused fear' is replaced by factual information and practical strategies for addressing issues.

v) Provide special events and projects

Special events related to learning for sustainability that interrupt the routine of the school are important. These should also be as inclusive as possible, with the opportunity for everyone to become involved. Events that have an added dimension that provides further enjoyment, interest and possible insight, are particularly effective. For example, where pupils are involved in planning for changes in their school or local community there are both valuable educational outcomes and increased motivation (see also *Uzzell* et al. 1994[12] and Uzzell 1999[13] for further discussion). Situations where groups of young people can share similar experiences, action strategies and success stories, as well as build friendships can be motivating. Young people often identify the friendships they form and opportunities to have fun together as intrinsic rewards for participation, along with the satisfaction that they can make a difference. Friendship should be recognised not only as a means to effective functioning of groups but, from the young person's perspective, a valued end in itself (Pancer and Pratt, 1999[14])

In schools where there is some focus on growing plants and where there are practical applications such as selling at local farmers markets or using them in the preparation of food items, pupils respond well. This also contributed to ideas related to a healthy diet. Healthy diets have been a feature of most schools in recent times. Schools have contributed well to this understanding, and whether pupils have school lunches or not they are well informed about what constitutes a healthy diet and are able to talk about this in some detail.

vi) Concluding comments

We need to ask what types of actions effectively address environmental problems. It is not enough simply to promote action for the environment; we need to emphasise the most strategic actions. In the literature a distinction is made between 'private sphere' and 'public sphere' actions (Stern, P. 2000[15]). 'Private sphere' actions are typically focused on switching off unnecessary lights, recycling, green purchasing, etc, and are a major area of emphasis in many schools. However, the solutions to many environmental problems are multifaceted and analysis of the world's most serious environmental problems suggests that the effects of these 'private' actions is limited unless it is combined with organising collective 'public' change. Pupils are likely to be led astray if they confine themselves only to actions in the 'private sphere'; but at the same time it is important to relate this to behaviour appropriate to young people depending on their age and stage. For example the use of persuasive writing has been shown to be effective, even with pupils of a young age.

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It may be helpful to consider that different variables have been suggested (Hungerford and Volk 1990[16]) that relate to positive environmental behaviour. These distinguish between 'entry-level variables' that predispose people to take an interest in the environment, 'ownership variables', such as a personal investment in particular environmental issues and making oneself knowledgeable about them, and 'empowerment variables' that include skills in using environmental action strategies and a belief in their possible success.

From the evidence of this study whether or not students are motivated in relation to environmental sustainability is not totally dependent on the school. Where pupils' families and the local community are supportive, this can have a considerable effect. This is particularly important at present in the current economic situation which is rapidly bringing about attitudinal and behavioural change. It is important to look for the best ways to engage with and support parents with low aspirations for their children or who feel alienated from the educational process. At the same time it should be recognised that parents and other members of the family are critical role models and young people are more likely to demonstrate positive environmental values if they are supported in the home.

The interaction between school and community was repeatedly shown to be important and here the terms 'learning for sustainability' or even 'sustainability' can be problematic, as it can cause confusion over what the school is trying to achieve.

2 The background to the study

This enquiry is set against a background of unprecedented recent interest and action on the part of the government and other agencies regarding learning for sustainability within schools. One useful starting point is the report by the Sustainable Development Education Panel, which was set up in February 1998 to consider, really for the first time, a broad interpretation of education for sustainable development and how these issues might be developed in schools and other institutions, and to make recommendations to the government for action in England [17]. Building on these ideas was *Taking the first step forward – towards an learning for sustainability* (Ofsted, 2003[18]), which helped to raise the profile and move the agenda on.

Perhaps the most significant stimuli for current developments have been two high level initiatives: Defra 2005[19] *Securing the future, UK Government Sustainable Development Strategy*, which relates to national concerns about these issues across all sections of society; and the *Every Child Matters* (ECM) agenda introduced by the government. The latter began with the Green Paper in 2003 and Children Act in 2004 and the supplementary part to the Act *Change for Children*[20] (see also subsequently DCFS 2007 *The Children's Plan: Building brighter futures*[21]). The emphases of these strategies are on children's health and safety, their achievement, their making a positive contribution and their well-being. These provide a valuable framework within which many educators can readily identify a way forward for a broad concept of learning for sustainability. Among other important contributions extending the debate has been the publication of *Every Child's Future Matters*[22] by the Sustainable Development Commission, which emphasises the role of the environment in supporting the aspirations set out in the ECM agenda.

Building on these foundations, the *Sustainable Schools Strategy* (DFES 2006[3]) has identified three main areas of focus: care for oneself; care for each other (including across cultures, distance and time); and care for the environment (local and global).

Also, in 2006, DFES launched the *Sustainable School Self-evaluation* document (known as s3), which provided a mechanism for each school to assess and monitor its own achievement in this field, using the framework already proposed in the Strategy. The document was revised in 2008[23].

The series *Sustainable Schools for Pupils, Communities and the Environment* provides first a response to comments and suggestions from a previous consultation with stakeholders in schools, including pupils (DFES 2006[24]), and then the Action Plan (DFES 2007[25]). It is clear that this is viewed as a long-term strategy, the goal of which is to reorient the education system gradually over a period of more than 10 years, but it has other shorter term goals to maintain the momentum.

Other initiatives also have aspects that relate directly to environmental sustainability in schools. For example, DFES (2004[26]) *Building schools for the future: a new approach to capital investment* is a programme that, among other things, aims to involve young people in discussions with designers and architects and to provide opportunities to consider issues of sustainability when planning the building of schools.

Recently there was a survey of 41 schools by Ofsted (2008[11]) which identified that the current state of provision in relation to education for sustainability is patchy, but there exist excellent examples of good practice from which others may learn. Also the enquiry into 'green leadership' in schools undertaken by the National College for School Leadership and its Leading Practice Seminar in March 2007[6], showed some of the different qualities of effective leadership in schools that enable the development of learning for sustainability in schools

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without compromising other important educational aims.

The main ideas that have emerged from these reports, enquiries and events have strongly influenced the direction of this present study. These include the idea that there should be a connection between learning and action; that schools can model good practice for children; and there can be a link between what the community of the school does and the way that schools demonstrate ways of working sustainably for the wider community.

This clearly links with ECM through the principle that every pupil should be enabled to contribute to the shaping of society and their own future. The eight 'doorways', or themes for action, set out in the *Sustainable Schools* document, are important and helpful in enabling schools to identify ways of addressing the sustainability agenda. Each of the themes – food and drink; energy and water; travel and traffic; purchasing and waste; buildings and grounds; inclusion and participation; local well-being; and the global dimension – provides a different point of access to many of the common issues of sustainability, and each relates to school life, the curriculum and the campus.

The contribution of specific government initiatives with related publications helps to support this approach to learning for sustainability in schools, for example DFES, 2004[27] *Healthy living blueprint for schools*; DFES, 2005[28] *Social and emotional aspects of learning*; and the joint publication between DFES and DFID, 2005[29] *Developing a global dimension in the school curriculum*. The latter, supported by the Global Gateway[30], enables schools to set up international partnerships. Finally, but by no means exhaustively, the Growing Schools[31] initiative has been set up to help schools develop the outdoor classroom and to link this to sustainability.

The voluntary sector has made a significant contribution, notably with the Eco-school Awards'[32], an initiative set up by the Foundation for Environmental Education, which has an emphasis on pupil participation in planning as well as implementation. The Royal Society for the Protection of Birds[33] and WWF-UK[34] both provide strong support for schools, working within the structures set up by central government. Also, there are more specific contributions, for example from the Centre for Research, Education and Training in Energy (CREATE)[35], and Waste Watch[36] – an organisation that provides education and training in schools related to waste reduction, reuse and recycling.

In the consultation that led to the government's Action Plan of 2007 the comments of young people as well as adults revealed many of their concerns over the state of the environment within their own communities, including traffic, pollution, noise, vandalism, litter, and land being used for buildings and industry that had previously been open space and natural areas. They also expressed concern about the prevalence of antisocial behaviour and racism, and about poverty, injustice and pollution on a global scale, as well as the thoughtless use of natural resources. There was a sense among young people that adults did not take these matters sufficiently seriously. All of this, clearly, has implications for learning for sustainability in schools.

By the end of the DFES Year of Action in 2007, it was intended that all schools would have received the message set out in the Sustainable Schools Strategy. The aim was that at least 60% of schools would have addressed the goals in the strategy through their development plans, and that 90% of these would have taken action and seen a measurable impact on pupil knowledge and the school's environmental performance.

The encouraging interest from all areas concerned with education, and the quality of the debate that has arisen, also means that the background against which this present enquiry has taken place is in a state of continuous change. However, the main purposes of the study set out in Section 2 have remained the same since 2005, when it first began.

3 The sample and methodology of the study

To address the questions about pupils' perceptions (see Section 1.1) over a period of 36 months, starting in July 2005, over 70 visits were made to 15 schools. These schools covered a range of primary and secondary schools and one special educational needs school. They are set in different parts of England, in both rural and urban environments. Brief descriptions of each school are found in Appendix. Although one special educational needs school was included among the schools in the study most of the findings relate equally well to that school as to the others, so no particular distinction needs to be made in terms of the overall findings.

Informal conversations and extended email exchanges also took place with the learning for sustainability coordinators within the schools. The intention was to make two annual visits to each school. These visits involved meetings with key staff, the opportunity to see aspects of what was happening in the school to promote learning for sustainability (this often included a tour with two or three pupils) and, most important, there were discussions with groups of pupils. The discussions usually involved groups of between 6 and 12 pupils and lasted for 35-40 minutes. In primary schools, groups were from Years 4, 5 and 6, and in secondary schools from Years 8, 9 and 10. Lists were made of the names of the pupils in each group so that on subsequent visits, the same pupils were often seen. The effect of this was that pupils who were in Years 4 and 8 in the first year of the project could be tracked for its duration to see whether it was possible to identify trends. Also, it should be noted that efforts were made in many of the schools to ensure that pupils who were not on the regular lists were included in discussions. This provided some indication of whether the findings were affected simply by concentrating on a few pupils from each cohort within the school, or whether more general outcomes could be identified.

Throughout the project, the intention was to maintain a balance between allowing pupils to set the agenda for the discussion and adopting an underlying pattern of questions, so that on every visit, whether to a primary or secondary school, comparability of results, including trends, might be obtained. Clearly, three years is rather a short period over which to obtain reliable data about changes of this kind, and therefore conclusions are almost certain to be somewhat tentative.

Discussions with pupils covered many aspects related to sustainable schools, including:

1. What they like about their school and local area and what they would like to change.
2. Their understanding of the functioning of the school council and the outcomes that have occurred as a result of decisions taken.
3. What the school does to make itself more environmentally sustainable.
4. Whether the school helps them to remain healthy and to feel safe and secure.
5. The reasons why they do the things that they have identified in 3 and 4 above.
6. The possible impacts on sustainability of not doing the things that have been identified.
7. Where they learn about matters related to sustainability.
8. Their attitude and understanding of more global issues, such as climate change or fair trade and their significance for sustainability.
9. What they think 'environmental sustainability' means.

Discussion and questions usually led from the familiar to the less familiar and from the local to the more global. Sometimes visual materials were used to facilitate discussion. These approaches usually worked well with pupils of all ages, with adjustments for appropriate language and vocabulary. Also, and importantly, it allowed the discussion to range naturally over all of the eight doorways and the *s3: Sustainable School Self-evaluation*.

The methodology employed some of the approaches used in the field of participatory action research (see for example Reason and Bradbury, 2001[37]; Gayford, 2003[38]; and Kindon, Pain and Kesby, 2007[39]). In this way, pupils were encouraged to decide what they thought was an important focus for discussion and how they thought outcomes might be evaluated. In later discussions with pupils, additional focus included aspects that enquire more closely into attitudes and possible behaviours. (See the theories of Reasoned action and planned behaviour Ajzen and Fishbein, 1980[40]; Sheppard, Hardwick and Warshaw, 1988[41]; and Ajzen 2005[42]). This involved using similar strategies to those outlined in the literature which have been used in extensive studies of attitudes and behaviours in many different contexts. Here discussion included the outcomes pupils expect if they carry out certain types of 'environmentally friendly' behaviour, their estimation of the attitudes or approval of these behaviours by their peers and others important in their lives, and their perception of their ability to control or carry out these behaviours or actions themselves. It is also appreciated that while these factors are likely to be significant, the reasons why people behave in particular ways are highly complex and difficult to predict. An extensive literature exists around this topic (see Heimlich and Ardoin 2008[43]).

There appear to be two parallel and interrelated dimensions to learning for sustainability: **content** (normally referred to as knowledge and understanding); and **process** (which includes competencies, abilities and actions). These have been used to help shape the study (see also Section 4.2). They are also used to describe a probable progression in pupils' understanding and participation in sustainability.

Each dimension has been given an overall set of broad descriptors (see below). It is recognised that pupils of different ages and at different stages are likely to be operating differently with regard to each of these, but the model appears sufficiently robust to function effectively. It is expected that the different stages in the progression are most likely to be reflected in the age of the pupils involved; however, one problem is that aspects related to the maturation of pupils are also likely to affect the outcomes significantly. Here the interests and changes that occur, particularly as a result of adolescence, can profoundly affect what pupils consider to be their priorities. There can also be increasing gender differences in attitudes towards matters such as healthy living, their own safety and security, and the attitudes of peer leaders to particular types of behaviour. For example, younger children usually seek adult approval, mainly through their parents and teachers, while for older children the approval of peer leaders, frequently of the same age, becomes a more important factor in determining behaviour.

What was sought as a progression in relation to **content** or knowledge and understanding were the following qualities:

1. 'Breadth', which is an appreciation of an increasing number of examples of things that contribute to or detract from sustainability.

2. 'Connections', which is an increasing ability to see interconnections and relationships between examples of factors that contribute to or detract from sustainability.

3. 'Consequences', which is an increasing ability to appreciate the consequences and impacts of measures to improve sustainability or factors that detract from sustainability.

4. 'Thinking creatively', which is an increasing ability to identify possible solutions to environmental issues.

5. 'Widening perspectives', which is an increasing ability to appreciate or understand different points of view and perspectives on the same issue.

6. 'Rationale', which is an increasing ability to develop an overall philosophy or personal rationale for sustainability.

N.B. Items 2 and 3 above are, in practice, usually closely linked.

The enquiry into **process** relates to competencies, abilities and actions that often relate to participatory activities in two different ways:

a) activities that are intended to directly bring about environmental improvement or that are concerned with decision-making in relation to intended improvements; and

b) the usual range of process abilities related to learning in a more general way, such as problem solving, accessing information, taking responsibility for their own learning and communicating new information.

Each of these can be considered from a number of perspectives:

1. The level of involvement in direct action intended to bring about environmental improvement. This includes the ability to cooperate and/or show suitable leadership skills.

2. The level of involvement in decision-making intended to bring about environmental improvement. This includes the ability to negotiate, to challenge appropriately or to offer alternative ideas with reasons.

3. The level of ability to show initiative in either of the above two areas.

4. The range over which relevant involvements take place. These include the school buildings and grounds, the local community, and involvements further afield regionally, nationally or internationally.

5. The level of ability to show independent thought.

Detailed notes were taken during each session, and following each visit an extended set of personal reflections on the outcomes of the visit were sent to the head of the school and to the learning for sustainability coordinator. The purpose was to encourage further debate and a sense of continuing involvement with the project, rather than for each visit to be viewed as an isolated event.

4 Full details of the findings from the study

Most of the schools were visited up to six times and a picture began to emerge from what pupils say, or deduced from conversations, about what they know, what they do and what motivates them with regard to issues of sustainability. This extended list of findings is in two parts. The first is under a number of headings and relates directly to the opinions expressed by pupils of their experiences. The second considers the progression of knowledge and understanding and process abilities, competencies and participatory actions of pupils.

[These findings are based on pupil opinion, rather than opinion of staff within the school.]

4.1 Findings related to the opinions and experiences of pupils

Some general observations and trends

1. The pupils in the primary schools have generally shown more enthusiasm for all aspects of learning for sustainability than most pupils in the secondary schools. They were frequently more eager to engage with the ideas and processes involved. There were some pupils in secondary schools that did engage well, but these were frequently in smaller groups, often based on friendships or pupils who related well to a particular member of staff.

2. Primary school pupils in the study were more likely to conform in their views to the received attitudes of the school/staff in relation to aspects of learning for sustainability than the pupils in the secondary schools, who were more likely to challenge, offer alternatives or to reject the ideas. Older pupils in the secondary schools were the most likely to be cynical about their personal contribution to sustainability, frequently expressing the opinion that it is the responsibility of others in authority.

3. It was possible, over the course of the study, to see improvements and a progression in pupils' knowledge of issues related to sustainability and the relevant abilities and competencies (see Section 3 for a brief explanation of the criteria used to make these judgements). Inevitably this was somewhat patchy and was more marked in some schools than others.

4. Where there were clearer increases in knowledge and relevant abilities and competencies, this was usually linked to an explicit emphasis in the school on sustainability, both within the curriculum, and more importantly as a key aspect of the ethos of the school.

5. Standards of achievement, behaviour and attendance in these schools were also high relative to the expected standard measures in these schools.

6. Some schools, particularly the secondary schools, have focused on an aspect of learning for sustainability such as climate change or the carbon footprint in a particular year or through a particular subject. This helped to raise the knowledge levels and attitudes of pupils compared to previous year groups. Since this type of focus has occurred only recently during this study it will be important to find out whether this effect is sustained as pupils progress through the school. On the other hand there is evidence that some of the older pupils in secondary schools feel that topics of this type are repeatedly addressed in different contexts within the school and this can have a negative effect.

7. It was clear that pupils of all ages need to feel that 'sustainability' is something that is valued within the school. There are many ways in which this is made evident to them and much of it may seem self-evident once pointed out. Notably the Head and others in the Senior Management Team must play an important role. This may be simply by taking an explicit interest and even becoming involved, or by encouraging special activities within the school.

8. Using activities such as assemblies simply as a platform for teachers to 'preach' to pupils, particularly in secondary schools, is often considered to be counterproductive. Innovative approaches to assemblies or other activities with strong pupil involvement in planning and presentation are frequently considered to be more effective.

9. Raising the profile of activities and achievements that focus on aspects of sustainability within the school or local community was shown to have a significant effect on pupils' enthusiasm for aspects of learning for sustainability. Pupils often responded well to the celebration of these achievements, especially if they are acknowledged by the local media or influential people in the community and in some cases recognised more widely – regionally or nationally. Some schools involved were successful in winning awards for their achievements, and celebrated within the school and wider community. The study found that pupils at these schools often made special mention of their successes.

Home and school

10. Unsurprisingly, the greatest gains are usually found where there is close agreement between the school and the homes of pupils about the importance of learning for sustainability, and these issues are discussed and practised in both. Several schools in this study have appreciated the significance of these home/school links and it was clear that as the study progressed pupils became more involved at home with issues such as recycling and energy conservation. The latter, in particular, followed recent national economic pressures.

11. Parental involvement in particular schemes has also been shown to be an effective motivator, and helps to consolidate home/school links. Widening parental access to the schools in more recent years, particularly in the primary schools, has increased the opportunities for this type of parental involvement, and pupils have remarked on this.

School councils

12. All schools in the study had pupil councils or similar. The structure may take different forms and the degree of pupil control varies. One of the most frequently heard comments from pupils was that the most successful school councils enabled pupils to feel that they have significant control over the meetings – for example, setting agendas and making records of meetings that are efficiently disseminated. Where school councils were most effective, pupils were usually able to point to recent tangible, or at least practical, outcomes.

13. The timescale between a school council making a decision and it being implemented was stated by pupils to be important because they tend to move on to different institutions after a few years, so long delays were usually interpreted by them as inactivity. This was the case among both primary and secondary pupils throughout the study. The more effective schools ensured that major projects could be divided into different stages, each with its own success criteria.

14. It was perhaps surprising to find that some primary schools have developed effective school councils with considerable pupil involvement. Successful examples were those that recognise there is a learning process that enables pupils to participate effectively. Thus, allowances are made for mistakes without necessarily taking away important elements of control.

15. Decisions about the frequency of school council meetings were a matter of concern in most schools in the study. The difficulty was maintaining sufficient continuity, so that pupils remembered what had been discussed at the previous meeting, while ensuring that there was enough time for useful outcomes to occur between one meeting and the next. As the study progressed it became apparent that pupils in the primary schools took a closer interest and were more informed if the meetings were no more than two weeks apart.

16. The great majority of the initiatives undertaken as a result of school council decisions that pupils discussed focused specifically on the school (frequently involving raising money). Examples included making improvements to the school grounds (the playground area in primary schools or outdoor leisure areas in secondary schools), planning a school disco, making changes to the school uniform, or deciding which charity they would support. Although throughout the study there were frequent complaints about the school toilets, there was only one instance, in the latter stages of the study, where this was addressed by the school council. There were only a few issues initiated by the school council that related to the local community.

17. Discussions with pupils of all ages tended to indicate that they considered the school council to be '*a good thing*' which provided the potential for greater involvement in decision-making within the school. The notion of democratic decision-making is often accepted, even if it results in decisions about which they personally do not agree.

Communication within the school

18. Communication within the school is something that many schools are struggling with, particularly in secondary schools. There was some evidence that a small 'elite group' became established, who often met regularly with the learning for sustainability Coordinator and therefore knew what was going on, but information was not communicated effectively throughout the school.

19. The use of dedicated notice boards that are regularly updated, particularly by the pupils themselves, seemed to be helpful. Feedback to whole classes, carried out by well briefed class representatives following meetings, was another important factor. Often the less involved pupils claim that '*they do not know what is going on*'. Cynically, this could be interpreted as symptomatic of a wider issue in relation to the 'less engaged' members of the school community.

20. The use of 'Year Books' or similar large poster displays helps to show not only what is happening, but also progress over a period of time and the variety of activities in which pupils have been involved. Plentiful photographs illustrating the involvement of a large number of pupils provided additional interest in both primary and secondary schools.

The curriculum and learning

21. Schools where there is natural integration between the formal curriculum and the less formal aspects of the life of the school often seem successful. Instances where pupils could identify where this was taking place increased in frequency as the study progressed. Clearly this integration has to be carefully planned, but when it does occur pupils develop a better

rationale and overall appreciation of aspects of sustainability. It is apparent that primary schools find this much easier to achieve, both because of having a smaller team of teachers working together and because the curriculum lends itself more naturally to this type of integrated approach.

22. Time and again pupils were able to point to where they had learned about matters such as recycling or climate change and provide simple explanations of the issues and their own responsibilities in trying to address these problems. Where this was particularly effective, pupils were able to identify activities – such as recycling, saving water or energy within the school – that can contribute to a wider perspective of caring for the environment.

23. In most schools, and especially in secondary schools, geography was usually stated by pupils to have a major role in increasing their knowledge and understanding of sustainability issues. This provided for them the greatest coherence, which was supported by science and some of the other curriculum subjects – with particular mention made of art and design. Pupils stated that the danger of repeated emphasis on particular issues, such as climate change, in different subject areas was avoided by effective planning in the schools. However, there was some evidence that older pupils found repetition of some of the major issues, such as climate change, tedious.

Understanding in relation to the eight doorways

24. The concept of the eight doorways has been a useful model, and pupils have shown considerable motivation in relation to particular areas over the course of the study, including exploring wider and more global issues related to sustainability.

25. Saving energy and, to a lesser extent saving water, are commonly encouraged in schools. Pupils related this initially to saving money. However, in relation to energy, during the course of the study an increasing number of pupils also saw the connection with climate change and could give explanations about the emissions of greenhouse gases from power stations into the atmosphere and how this contributes to the process. The consequences of climate change are nearly always related to the melting of ice caps and increased incidence of flooding; occasionally the incidence of more extreme weather conditions is mentioned but there is almost never a mention of the problem of extensive droughts.

26. There was, without exception, confusion over the role of the ozone layer – it is confused with the heating effects involved in climate change. Older pupils sometimes understood the role of the ozone layer in reducing ultra violet radiation and the harmful effects of ozone depletion (often put down to leakage from redundant refrigerators and aerosol cans), but the concepts remained confused.

27. Waste reduction, particularly related to recycling, was well established in most of the schools. The focus was usually particularly on recycling paper, but increasingly other items, such as mobile phones, were included. From the beginning of the study pupils, even from an early age, understood that trees are important in cycling oxygen and carbon dioxide. However, there were consistent misunderstandings about how the destruction of tropical rainforests impacts on this vital function. Most pupils regarded trees as a source of raw material for paper, among other things.

28. Most pupils in both phases of their schooling understood about different aspects of waste disposal. This has continued to improve over the course of the study. They were informed about what materials can and cannot be recycled, except that they admitted to problems with different types

of plastic. They also usually now knew about the problems of landfill and incineration as well as excessive packaging. A large proportion of the pupils that took part in this study claimed to recycle at home and they appeared to be encouraged by their parents.

29. Rainforests are studied extensively in primary schools, and pupils saw these as important habitats for animals, particularly the more exotic species. The conservation of wildlife was considered by most pupils in both phases of schooling to be a good thing per se. They frequently expressed anthropomorphic views, such as '*animals have feelings too and want to continue to survive*' or anthropocentric views, such as '*you never know when they will be useful to us*' or '*it is nice for us to be able to see wild animals*'. Some pupils in both phases of schooling, particularly the older ones, showed the beginnings of an appreciation of the need for balance in nature, which some of the endangered species help to maintain, and the need to maintain the habitats in which these animals live.

30. Travel and traffic were often issues that pupils appreciated at first hand. They were well aware of the dangers to their personal safety; aware that fuel is an increasingly scarce resource; and often aware of the polluting effects of heavy traffic. They frequently expressed a desire to cycle to school, but in practice they admitted to constraints due to road safety, the security of cycles while at school, and sometimes the distances involved. However, throughout the study, in several of the schools in particular, initiatives had been taken to increase the opportunities for pupils to cycle to school and to improve their road safety knowledge, and this was appreciated by pupils.

31. Healthy diets have been a feature of most schools in recent years. The problem here at a national level is that pupil interest and uptake in school lunches seems to be declining, especially in secondary schools. This was the case in several of the schools in this study. The pupils complained that the food provided was often a) more expensive; b) that there was less choice; c) that it was bland and 'boring'; and d) that portions were often smaller. In schools that were taking measures to address these problems, pupils reported that there was some success.

32. Nevertheless, whether pupils had school lunches or not they were generally well informed about what constitutes a healthy diet and they were able to talk about this in some detail. Schools seem to have contributed well to this understanding. In schools (usually primary schools) where there is some focus on the growing or preparation of food items, pupils responded well to the notion of a healthy diet in this context.

33. Throughout the study, pupils were asked what they would choose to eat and drink, if given a free choice. Most of them appeared honest and said that they would prefer a mixture of healthy and unhealthy options (what might be described as 'fast foods' were often cited as desirable options). It was also apparent that girls, even from an early age, were more inclined to choose more healthy options than boys.

34. Some pupils in both phases of schooling, particularly in the latter stages of the study, had a concept of sustainable food, normally in terms of locally grown and locally sourced. Usually this was in the context of 'food miles' and home grown produce that was broadly organic and fresh.

35. Particular focus on 'inclusiveness' at some time of the year, such as anti-bullying week, was often mentioned as being effective. This was especially so where it was within the broader context of pupils being given special responsibilities such as acting as peer counsellors, buddy systems that can help improve the transition from primary to secondary school, or in primary schools specific pupils were encouraged to befriend children who

were new to the school or who may have special needs. Over the course of the study all of these aspects appeared to be given increasing emphasis by the pupils.

36. In conversations with pupils in schools with a range of ethnic backgrounds it was often striking that they stated explicitly that they value this diversity as a particular feature of their school. Even at an early age, they were aware of racism or other forms of discrimination; but the great majority of pupils appreciated what they experienced in school and considered the problem, if it existed, to be one found in the wider community, but not in their school.

Further things that motivate pupils

37. Pupils made it clear that they appreciated special events that interrupt the routine of the school. Activities such as measuring personal carbon footprints, fair trade days (or fortnights), visits, including those to places within the locality that provide a fresh view of aspects of sustainability, or an international week with visitors from a distant part of the world were all mentioned and stimulated further interest. However, from conversations it is important that such events have the potential of providing something different, interesting and even a challenge.

38. Special activities and events related to sustainability need to include the element of 'fun'. For many pupils this includes the opportunity to cooperate with friends and to form new friendships.

39. Most schools are already involved in worthwhile activities such as paper recycling, saving water or energy, or focusing on transport to and from school. Where schools had introduced an added dimension that provided further enjoyment, interest and possible insights, this has been particularly effective. For example, where pupils are involved in monitoring, recording and reporting the effectiveness of these matters, or planning for changes in their school or local community, there are both valuable educational outcomes and increased motivation, which they frequently commented upon.

The global dimension

40. International contacts were also frequently a source of considerable interest, and involvement in these appeared to be increasing throughout the study. Where these contacts relate to developing countries, initially they were often simply viewed by pupils as a focus for charitable activities by the school. However, where the schools have developed a global dimension to improve cultural understanding, the benefits were often even more educationally significant. In these circumstances some of the pupils understood that there is something that they can learn socially from other cultures, rather than considering them as less fortunate. There were cases where pupils, even in primary schools, mentioned the ways in which other cultures had different attitudes to family and support of the elderly. These were stated as aspects from which they could learn. This also helped to overcome the problem of cultural stereotypes.

41. Some pupils with a more developed view of the global perspective articulated a view that communities worldwide are each affected by the behaviours of others in different countries and that what we do in this country has implications for those even in remote places.

42. In a few cases, emphasis on the global perspective has resulted in entrepreneurial activities in which some of the pupils less involved in other aspects of the school were willing to participate.

43. In relation to the global dimension some pupils, even from an early age, had a simple but clear view of what constitutes fair trade, and its importance. This sometimes developed into concern for the exploitation of labour in poor countries and social justice.

44. In discussion with pupils it appeared that charitable events, often in relation to an international situation, had increased educational value if put into a broader context, and if follow-up activities were included.

The concept of sustainability in relation to the environment

45. The great majority of pupils throughout the study, including some of the youngest (in Year 4), had heard of the word 'sustainability' as applied to the environment. Perhaps, not surprisingly, relatively few could give a satisfactory explanation. If they were able to suggest a personal concept, for example most would say '*to keep things going as they are*'. The concept of environmental improvement was also often implied but not explicitly articulated.

46. From the evidence of this study, pupils' motivation in their behaviour towards sustainability did not totally depend on the school. Where pupils' families and the local community were seen by them to be supportive, this could have a considerable effect. The interaction between school and community was shown to be important and here the terms 'learning for sustainability' or even 'sustainability' could be problematic, as it could cause confusion over what the school was trying to achieve.

47. It is acknowledged, and there is supporting evidence from this study, that as pupils progress from childhood to adolescence, their priorities often change. What is considered 'cool' and acceptable at one stage is frequently considered quite differently at another. In conversations with pupils of most ages the influence of older siblings or relations was stated to have a significant effect on whether a pupil was willing to adopt at home the types of behaviours encouraged in school. Also, in a related way, what they say may not really reflect their behaviour at home or in their local community. The impact of recent economic pressures is now likely to be highly significant.

4.2   Progression of knowledge and process abilities

The purpose of the following description of the progression in learning for
sustainability derived from observations made in this study is to create, possibly
for the first time, a set of descriptors which consider the learning experiences
from the perspective of pupils. It is not suggested that this description is
comprehensive, nor that it should not be significantly modified or challenged
in future following further studies. What is presented here is a model against
which future observations can be compared or discussed in order to refine
or challenge aspects of the model. It is based on three years of observations
and discussions with pupils in schools and includes the progress of specifically
identified pupils, some of whom have been tracked throughout the three-year
duration of the project.

The two parallel, but interconnected, aspects to the progression of content
and process have each been divided into four **stages** (see Section 3 of the
report, which describes the relevant aspects of the methodology). Each
of the four stages of the progression was assessed according to the six
qualities (descriptors) for **content** and five for **process** identified. While each
stage is presented as though it appears to include one set of descriptors
and exemplars addressing each parameter, in practice it was observed that
most pupils could be operating at different stages with regard to different
descriptors. The use of the model is therefore to provide a general impression
of the stage at which individuals are operating rather than an accurate
assessment of where they are on a scale of achievement. It should also to be
appreciated that each description of a stage is a simplified 'thumbnail sketch'
and many more examples could have been included.

4.2.1   Content knowledge and understanding

Stage 1. This seems to begin with awareness of a number of issues that
impact on sustainability. The links to the bigger picture are not apparent, or
where these exist they are very basically understood. Such issues frequently
centre on the following: the school as a safe environment; aspects of healthy
living; saving energy; recycling; improvement of the school estate, particularly
the grounds such as setting up a wildlife area; transport; and some aspects of
international understanding that may include fair trade.

The school as a safe place often focuses on whether they are the victims
of bullying (this can include name-calling as well as the physical aspects of
bullying). Here there is emphasis on making friends, welcoming newcomers
and the need to be inclusive. Bullying is viewed as an important matter,
particularly by younger pupils, and the need to befriend or protect those with
'special needs' is often quite highly developed. Healthy living focuses on a
healthy diet (fresh vegetables, food cooked on the premises and the availability
of drinking water) as well as the opportunity for exercise (indoors and outside).

Improvements to the school estate are usually seen as enhancing the grounds
as a resource for learning, play or boosting physical fitness. For example,
introducing or improving existing play equipment or 'livening up' areas within
the school by decorating. Overall the conception is to make the school a more
interesting or exciting place for learning or relaxation.

Links to wider issues are often difficult to discern except that it is accepted by
the staff in the school that an environment that is more conducive to learning
and pupil attendance will have an effect on overall pupil involvement with the
life of the school. There is often an understanding of the need for conservation,
particularly in terms of saving energy, water and other resources, such as
paper. The need for this is often understood in terms of saving money or in the
case of paper to save trees. (Recycling is frequently limited to paper in schools,
for practical reasons.)

There is almost always confusion between the sort of trees that are used for paper pulp and the more general issue of trees that form the major 'natural' forests, including the equatorial rainforests and the conservation of biodiversity that often centre on these regions. However, there is a growing recognition that forests are places where animals live. To conserve wildlife their habitats need to be retained. The importance of conserving wildlife is mainly in anthropomorphic terms such as '*you would not like it if you were made extinct*' or '*they [animals] have as much right to live as we do*'. There is no concept of an overall balance of nature or that plants are anything more than the food or part of the habitat of the animals.

Any link between energy conservation and climate change has usually not yet emerged, but there is an emergent concept of climate change in terms of the melting of ice caps (which is often associated with threats to the survival of polar bears) and increased flooding, which is understood to be caused by air pollution.

Transport usually relates mainly to journeys in relation to school attendance and consequently they are concerned with ways of reducing or optimising the use of motorised transport.

The global dimension is mainly concerned with what people eat or wear, and the types of dwellings they have. Where pupils have even heard of fair trade, it is usually understood in terms of straightforward 'fairness' and is often expressed as '*the farmers get paid a very small amount in comparison with the cost of things in the supermarket*'. Links between poverty and environmental degradation or population migrations are not made at this stage. Pupils at this stage do not know about the term 'sustainability' in relation to the environment. Appreciation of different perspectives on issues related to sustainability is very under-developed, with a general acceptance of the authoritative attitudes or views of teachers or other 'important adults'. An overall rationale or personal philosophy is very limited, and aspects of sustainability are considered in a fragmentary way, or with very simplistic generalisations.

Stage 2. This stage appears to involve a more comprehensive range of issues that relate to sustainability, with an increasing appreciation of global issues. However, much of the understanding still focuses on the local environment, particularly the school buildings and estate. Views about the school as a safe place still focus on the role of important adults to maintain a safe environment. But there is often an increased expectation that they have a personal role as well, apart from simply reporting unacceptable incidents. This role may involve more mature pupils acting as 'counsellors' who need to have an understanding of the importance of confidentiality. Others may think that it is important actively to befriend children who are new to the school or who appear to be socially isolated. Bullying and its prevention are still seen as important issues. Social inclusion is well represented, as is the need to avoid discriminatory behaviour. Interestingly, racial discrimination is often mentioned but gender discrimination much less so.

The school as a healthy and health promoting environment is more clearly understood. This relates to healthy eating, with emphasis on fresh and, where possible, locally grown produce, as well as on the importance of exercise. Sometimes the conflict between personal preference for certain types of foods that are classified as unhealthy and the need to eat more types of 'healthy food' is appreciated. The availability of drinking water throughout the day is often emphasised.

There is the beginning of a clearer awareness of some of the major global issues and of how these are linked to local actions within the school, but this is in its early stages. Connections between different actions carried out by themselves and others are beginning to emerge more clearly. For example,

links between actions that are desirable in relation to sustainability and their financial costs; also the connection between what different sections of society may want and their impact on sustainability.

Actions are seen to follow a longer chain of consequences, so that if one thing happens then others follow. For example, with regard to recycling and waste management, this can reduce the amount of landfill, and landfill itself can have undesirable consequences, such as unsightliness and the shortage of suitable sites; and the possible alternative of incineration has its disadvantages. Furthermore, it is appreciated that there are energy implications associated with recycling that should not be disregarded (for example, where journeys are undertaken specifically to recycling sites). There are consequently the beginnings of an understanding that actions intended to bring about improvements can also have undesirable side-effects. Elsewhere, other links are being made, such as between poverty, fair trade and environmental protection. A sense of 'fairness' still pervades, and other economic factors are either disregarded or seen as of much less importance, such as the need for each stage of the supply chain between producer and purchaser to be economically sustainable.

Diversity, particularly biodiversity, is still largely considered in terms of endangered species, with emphasis on large and exotic animals in distant places. However, habitat preservation is more firmly established as a supporting concept in maintaining biodiversity. There are emergent understandings of the importance of maintaining biodiversity in order to preserve a natural balance in nature. For example, it is sometimes said that if one type of animal is removed from a system then others may either lose a vital food source or will lose a natural predator and they will then become over-abundant. Pupils appreciate the significance of the development of special areas in the school grounds or locally that encourage diversity of flora and fauna, but they don't really make links with sustainability – these are largely treated as areas of interest and a focus for study.

Energy conservation and its importance is more firmly established and is linked to a more extended chain of consequences, such as climate change resulting in droughts, the melting of ice caps and floods. The causes of these changes are often put down to increasing industrialisation, power stations and the ever growing volume of motorised transport. Here a concept of 'greenhouse gases' is usually articulated, where it is simply thought of as '*a blanket that traps heat around the Earth*'. Their own role in reducing these effects is more clearly appreciated and often includes rigorous attention to switching off lights and other electrical apparatus when not in use, closing doors and windows in cold weather, etc.

Appreciation of alternative perspectives that can have a different rational basis is beginning to become apparent but there is still an overriding feeling that there is clearly one 'right' perspective. With regard to an overall rationale there is an increasing awareness of personal responsibility towards the environment in which each has a contribution to make, however small; and also that a number of different factors all contribute to sustainability. There are the beginnings of an appreciation of the role of large commercial organisations and the major decision-makers in environmental sustainability.

Stage 3. At this stage a more holistic view of sustainability is emerging. There is an appreciation of many more examples of factors that affect sustainability. These examples are both local and global. The implications of local actions are seen to have possible global impacts and vice versa. This is seen in the understanding of the importance of actions such as the conservation of resources through reuse or recycling as well as energy conservation and the possible impact on global climate change. Healthy living is still an important matter and continues to focus on a healthy diet and exercise, but also for older

students a greater awareness of the effects of legal and illegal drugs. Safety and security continue to be matters of concern but pupils have an increasing appreciation of their own role in this and their contribution to addressing problems that might arise, for example by acting as 'counsellors', which includes a responsibility to the victims of bullying. Diversity within their own community is something that is now more clearly appreciated, as is the need to be inclusive. This is starting to extend further than the immediate confines of the school. The promotion of active citizenship and local improvement continues to develop and this includes increasing involvement with activities within the school that offer opportunities for pupils to express their views and preferences.

Diversity is still seen largely as a matter of biodiversity, with more emphasis now on the maintenance of habitats that will sustain diverse animal and plant populations. The importance of balanced populations where each organism is integral to the system is beginning to be appreciated. However, the damaging effect of international trade, particularly in animals or parts of animals or in activities such as logging, are seen as an important factors, with less awareness of the need to develop effective agriculture in areas where animals are endangered. This especially centres on tropical environments. There is growing awareness of the reduction of so-called 'natural' areas for plants and animals in their own locality and the need to develop these in order to maintain populations of native fauna, mainly birds and butterflies. Thus, connections are more widely appreciated between different aspects of environmental protection, and the consequences of different actions are more clearly understood. There is a growing link being made between 'ethical' matters and activities that promote sustainability.

There is an increased appreciation of different perspectives on particular environmental issues. This includes conflicts between economic, social and environmental interests. An example is the need for farmers to grow crops to produce high yields or to maximise animal production against the concerns of those with animal rights interests or those who wish to preserve areas for indigenous wildlife. Pupils are more aware of the nature and scale of the use of resources such as energy and water, both within the school and elsewhere, and there is a greater appreciation of the wider impacts of these in relation to sustainable living and also of the difficult dilemmas that this raises. Reduction of use of these resources and the management and reduction of waste are seen as important and something where they have a personal responsibility. The social and economic use of motorised transport and the range of different interests involved are also appreciated. An overall rationale or personal philosophy is becoming more defined and comprehensive, and is less simplistic with a larger number of caveats, more alternatives and less certainty about what is the 'right' approach to take.

Stage 4. At this stage the basic issues such as healthy living and safety and security are accepted as aspects of life, where the individual has a responsibility for their own health and safety but it is important to work collaboratively with those in authority and to see this as a collective responsibility. Individual differences within the community are even more clearly appreciated, both in terms of needs and expectations and the need to reconcile these as far as is reasonable.

They are even more interested in aspects of conservation of resources within the school and in the local community and are frequently concerned with the need for monitoring the effectiveness of various measures taken. The understanding is now much more holistic, with a large number of examples of factors affecting sustainability drawn locally, nationally and globally. This tends to give an appreciation that almost anything ultimately has an impact on sustainability. At the same time the fact that there are often legitimate

competing ideals and demands in relation to the major environmental issues of the day is more clearly recognised, but also there is emphasis on the need for evidence, rather than isolated examples, to support arguments.

It is appreciated that individuals have a part to play through their own behaviour but also that governments and commercial organisations have a significant contribution to make. The role of the individual in affecting policy is beginning to emerge, as well as the persuasive effect of the purchasing power of the consumer. Examples of this can be seen in policies over the use and management of motorised transport in urban environments, or choosing particular types of goods that make less impact on the environment. Matters such as recycling are seen as less straightforward, with aspects that detract from the effectiveness of this activity as well as the positive effects.

Connections are seen between many more factors related to the environment and these are closely related to the consequences of actions. For example, the matter of conservation of elephant populations in Africa, their role in encouraging tourism, their destructive behaviour towards local human populations and the possible negative impact of tourism. Another example is the impact of vehicular traffic, power stations and air transport on climate change, where the importance of evidence as well as the need to protect livelihoods and to take account of the real financial implications of actions all need to be considered.

There is growing awareness that there are many different perspectives to be taken into account and that it is often impossible to reconcile all of these. Therefore the role of decision-makers is important, and the law has an essential contribution to make. However, the law on its own is insufficient, and education and persuasion are also important factors. Links between sustainability and 'ethics', such as matters related to human rights and individual freedoms, are now much more clearly appreciated. An overall rationale is difficult to achieve but a personal philosophy generally sees the individual as central in terms of direct personal behaviour, power to persuade others including governments, and power through being aware consumers.

4.2.2   Process abilities

The progression identified here relates to the different types of process abilities, competencies and actions identified with regard to the five different descriptors of qualities.

Stage 1. This includes direct involvement in environmental improvement activities, usually with careful and explicit direction from adults. Often this involves pupils persuading other adults (such as parents) to assist. Sometimes this also involves directly raising money for the work to be done by professionals. These frequently result, for example, in creating a small wildlife area, or enhancing the play/recreation facilities or the areas used for growing plants. Activities also include practical conservation measures such as recycling and saving water and energy, but these are mainly promoted and initiated by adults within the school and the pupils take an interest in progress.

There are the beginnings of empathy towards individuals in the school who are different from themselves, particularly those who have physical special needs or who are experiencing language difficulties, such as those who have recently arrived from other countries. Some are quite proactive in trying to ensure that these individuals are not left out and make friends. Pupils are actively involved in initiatives to help them remain healthy, such as healthy eating and taking exercise (for example regularly participating in the 'walking bus' to and from school), but this is mainly by following direct guidance from responsible adults within the school. They actively participate, under careful supervision, with measures to improve safety around the school. This may include anti-bullying initiatives such as 'buddy' schemes.

There is little opportunity to show leadership skills in the practical aspects of environmental improvement but some pupils may be particularly proactive in getting aspects of the work done. At this stage, pupils are willing to be involved, such as taking part in a rota of duties for watering plants or maintaining food supplies on bird feeders. Cooperation is usually heavily supervised and much of the activity involves cooperation with ideas suggested by adults. There are the beginnings of involvement in the decision-making process, including representation on the school council. This is seen as an important and possibly exciting activity and one with which they are keen to be involved.

The notion of representation of other people's views is introduced and some pupils show emerging leadership skills. There are the beginnings of an appreciation of what ideas may be realistic, generally linked to economic viability or the time and effort required and whether the change is likely to be to the benefit of the whole school community. The ability to challenge authority figures appropriately is very limited. Initiative is limited and tends to build directly on ideas that have been previously suggested.

Most of the projects devised to bring about environmental improvement centre on the school and its estate and much less frequently the immediate local environment. Schemes that have a wider perspective, such as focusing on another geographical region or community in a distant location are primarily to extend understanding of different lifestyles and communities or may have a charitable function. Pupils at this stage take little responsibility for their own learning, although they enjoy finding things out under close supervision.

Stage 2. Direct involvement in activities to improve the environment and to conserve resources and energy continues as a feature at this stage, with more involvement in the decision-making process and in the generation of ideas. Teachers are still the major motivators and those who control and direct much of the activity. Cooperation more naturally occurs within friendship groups and can result in a fair amount of initiative being shown in alternative ways of bringing about desired outcomes. Leadership skills are beginning to emerge more clearly among some members and this can include evidence of the ability to listen as well as express opinions. These may or may not be the more obvious natural peer group leaders and some pupils can find this is something at which they can excel even though they may not show comparable excellence elsewhere.

The ability to be involved in decision-making is increasing and pupils are more proactive in ensuring that they are canvassing opinion when representing ideas in formally constituted contexts, such as a school council or eco council, and generating ideas about new initiatives. The existence of a school council is valued, but in a few cases there are the beginnings of a critical view when the outcomes of ideas put forward by the school council result in few being implemented or there are long delays. There are the beginnings of a willingness to mildly challenge both each other and those in authority and the ability to provide some rationale for the challenge, but they are also willing to listen to and consider alternative ideas. The ability to accept decisions made democratically about which they do not agree is becoming established.

Healthy living and enhancing safety are still features. Pupils express dietary preferences but are willing to accept that certain types of food are more 'healthy' and will include more of these in their meals in school and claim that they will do so when they have a free choice elsewhere. They are more aware of their personal safety and their security within the school. There is an appreciation that they have a personal responsibility as well as being willing to report incidents appropriately.

Empathy with peers who are considered 'different' is fairly well established and is sometimes expressed in more formal structures such as 'buddy schemes' or the use of friendship benches, which are actively adopted by pupils at this stage. Anti-bullying approaches have similar qualities to those described at Stage 1 but may take more proactive forms such as the identification of pupils who appear to be the target of bullying. They are more likely to be involved in simple forms of peer counselling, where confidentiality is taken seriously. It is notable that there is often a gender difference, with girls rather than boys being more willing to take these responsibilities.

The range over which projects and initiatives are directed is increasing and there is an increased tendency to look out from the school and its estate to the local community and beyond and to try to gain from the expertise of those living locally. Initiatives that look out more internationally begin to have a more explicit focus on aspects of sustainability, even if there is still a strong 'charitable' dimension.

Pupils at this stage are developing more facility to access information to support their learning and activities related to learning for sustainability and they are beginning to take some initiative in this direction.

Stage 3. The school and grounds continue to be the focus for much of the practical activity, including quite ambitious projects to enhance the environment. This might include creating significant changes to the recreational areas or improving the scope for learning activities outside, such as creating a pond, or redecorating rundown areas within the buildings. Active participation in day-to-day measures to reduce the environmental impact of the school continues to be apparent. This still includes practical activities, such as reducing energy and water consumption, waste management such as recycling (including paper but sometimes cans and mobile phones).

Pupils are generally willing to participate, and this is enhanced by increased opportunities to become involved in the decision-making process and to monitor changes. Pupils are beginning to take a lead in this under the careful guidance of well-motivated teachers. Leadership emerges both in terms of ways of cooperating with practical tasks and making the case for changes within the decision-making process. There is even a clearer understanding that to challenge the *status quo* is permitted, provided that this is done using acceptable means and supporting ideas with reasoned argument. Levels of criticism can be quite high if it is felt that insufficient progress is being made with new initiatives. The ability to negotiate effectively is not well developed yet.

Pupils are encouraged to find out more for themselves about local resources to assist with their projects and this includes the use of the internet, local government and voluntary organisations. Consequently they show considerably improved ways of accessing information and more initiative in seeking assistance. Levels of cooperation can be quite high, particularly among certain groups of well-motivated pupils. With regard to improving the facilities of the school or finding more effective ways of reducing their environmental impact, pupils are more willing to approach decision-makers within the school and even responsible officers within their local community.

Listening skills and the ability to appreciate alternative views and ways of doing things are now more apparent than at Stage 2. Pupils are beginning to see their role even more clearly as one of advocating behaviours that should enhance sustainability; this extends to the home and even to others elsewhere in the school. There is now even more interest in activities extending beyond the school – takjng the advocating role into the local community and identifying projects that can relate to sustainability in distant environments. However, the latter may still be restricted to fundraising for organisations that champion conservation in some form or another.

With regard to matters of ensuring a healthy lifestyle and personal safety, pupils are beginning to advocate healthy diets and taking exercise, even sometimes arguing for the right to be able to cycle to school rather than to be taken by car. Safety is seen in a wider perspective and as an issue where they have a collective responsibility. Anti-bullying and inclusiveness are seen in the context of the school including a diverse range of people, which in itself is valued. Again, initiatives such as 'buddy' schemes and peer counselling are undertaken, and in the latter case the need for training and issues such as confidentiality are carefully maintained.

Stage 4. In this stage, the school buildings and grounds begin to emerge more clearly as an intended model for sustainable behaviour. Participation is an important aspect of pupil behaviour. This includes involvement of pupils in monitoring the effectiveness of their initiatives, which might include conservation of resources and energy. There is an even greater tendency to seek the expertise of those outside the school to assist with this and to be proactive in a variety of ways to get things done. Communication of ideas is seen to be an important part of the process of enlisting the assistance of a wider range of people within the school community. Pupils are keen to take the initiative in this and use their skills in accessing information to make this more effective.

In collaboration with well-motivated members of staff and others, pupils may take on quite ambitious projects such as making useful objects from recycled materials or generating energy from solar sources. Pupils are much more proactive with regard to school council type activities, drawing up agendas, keeping records, suggesting ideas, representing constituencies of pupils, lobbying for support, and following up afterwards. Ideas are often more realistic in terms of economic viability and the time and effort involved. Pupils actively seek additional assistance and expertise from within and outside the school, again using the internet, local government, local businesses and voluntary organisations. Cooperation is actively sought and can be very high among the most motivated. Leadership skills are further developed, including showing initiative and listening skills. The ability to appreciate, and where appropriate, accept alternative views is more clearly identified.

Activities relating to healthy lifestyles extend beyond diet and exercise and include a broader appreciation of well-being. The concept of the school and community containing a diverse population, with different needs and often different lifestyles, is appreciated and seen positively. Health and safety are again considered in a broad context and often interrelated to include a wide range of matters that will enable them to maintain a healthy lifestyle. Actions to help others remain both safe and healthy are frequently advocated. This may involve direct participation in planning visits outside the school, with emphasis on developing risk awareness.

Pupils are clearly advocating behaviours that they see as environmentally sustainable, both within and outside the school – particularly at home, where they may be taking the lead. Interest and concern for global and local issues is much more clearly identified and this includes awareness of political, social, cultural, scientific and technological aspects. There is a strong wish to find out more, and to publicise and communicate information, ideas and opinions with regard to these issues, many of which are the major environmental issues of our time.

5 References (including websites)

1. WWF 2004 *Pathways: A development framework for school sustainability,* WWF-UK: Godalming.

2. WWF 2005 *Learning for sustainability – Planning a classroom topic on communities and sustainability*, WWF-UK: Godalming.

3. DFES 2006 *Sustainable schools for pupils, communities and the environment: government response to the consultation on the Sustainable Schools strategy*, DFES: Nottingham.

4. Organisation for Economic Cooperation and Development (OECD) 1995 *Environmental learning for the 21st century*, OECD: Paris.

5. Rickinson, M 2001 Learners and learning in environmental education: A critical review of the evidence, *Environmental Education Research Vol 7 No3*, pp 207-317.

6. National College for School Leadership 2007 *Leading sustainable schools: what the research tells us*, NCSL: Nottingham.

7. Chawla, L and Flanders Cushing, D 2007 Education for strategic environmental behaviour. *Environmental Education Research Vol 13 No4*, pp 437-452.

8. Kirby, P, Lanyon, C, Cronin, K and Sinclair, R 2003 *Building a culture of participation involving children and young people in policy, service planning, delivery and evaluation*, DFES Research Report: Nottingham.

9. DCSF 2003 *Giving children and young people a say*, DCSF: Nottingham.

10. Whitty, G and Wisby, E 2007 *Real decision making? School councils in action,* DCSF Research Report: Nottingham.

11. Ofsted 2008 *Schools and sustainability: a climate for change*. [HMI No 070173] Ofsted: London.

12. Uzzell, DL, Davallon, J, Fontes, PJ, Gottesdienner, H, Jensen, BB, Kofeod, J, Uhrenholdt, G and Vognsen, C 1994 *Children as catalysts of environmental change: report of an investigation on environmental education*, European Commission: Brussels.

13. Uzzell, D 1999 Education for environmental action in the community: new roles and relationships, *Cambridge Journal of Education*, Vol 29 No3, pp 397-413.

14. Pancer, SM, and Pratt, MW 1999 Social and family determinants of community service involvement in Canadian youth, in: Yates, M and Youniss, J [Eds] *Roots of civic identity*. Cambridge: Cambridge University Press pp 32-55.

15. Stern, P 2000 Toward a coherent theory of environmentally significant behaviour. *Journal of Social Issues* Vol 56 No3, pp 407-424.

16. Hungerford, H and Volk, T 1990 Changing learner behaviour through environmental education. *Journal of Environmental Education* Vol 21 No3, pp 8-12.

17. Sustainable Development Education Panel 1998 *Learning for sustainability in the Schools Sector*, available from www.defra.gov.uk/environment/sustainable/educpanel/index.htm

18. Ofsted 2003 *Taking the first step forward – towards an learning for sustainability*, [HMI No 1658] Ofsted: London.

19. Defra 2005 *Securing the future, UK Government Sustainable Development Strategy*, [CM 6467], TSO: Norwich.

20. DFES 2004 *Every Child Matters: change for children*, DFES: Nottingham.

21. DCSF 2007 *The Children's Plan – Building Brighter Futures*, TSO: Norwich.

22. Sustainable Development Commission 2007 *Every Child's Future Matters*, SDC: London.

23. DFES 2006 (Revised 2008) *s3: The Sustainable School Self-evaluation for primary, middle and secondary schools*, DFES: Nottingham.

24. DFES 2006 *Sustainable schools for pupils, communities and the environment: Government response to the consultation*, DFES: Nottingham.

25. DFES 2007 *Sustainable schools for pupils, communities and the environment: An action plan for the DFES*, DFES: Nottingham.

26. DFES 2004 *Building schools for the future: a new approach to capital investment*, DFES: Nottingham.

27. DFES 2004 *Healthy living blueprint for schools*, DFES: Nottingham.

28. DFES 2005 *Excellence and Enjoyment: Social and emotional aspects of learning (SEAL)*, DFES: Nottingham.

29. DFID 2005 *developing a global dimension in the school curriculum*, DFID: Glasgow.

30. Global Gateway (see www.globalgateway.org.uk).

31. Growing Schools (see www.teachernet.gov.uk/ Growingschools).

32. Foundation for Environmental Education, Eco-Schools (see www.ecoschools.org.uk).

33. The Royal Society for the Protection of Birds (see www.rspb.org.uk).

34. WWF-UK (see www.wwf.org.uk/oneplanetschools).

35. The Centre for Research, Education and Training in Energy (see www.create.org.uk).

36. Waste Watch (see www.wastewatch.org.uk).

37. Reason, P and Bradbury, H 2001 *Handbook of action research: Participatory inquiry and practice*, Sage: London.

38. Gayford, CG 2003 Participatory methods and reflective practice applied to research in education for sustainability, *Canadian Journal of Environmental Education*, Vol 8, pp 129-142.

39. Kindon, SL, Pain, R and Kesby, M 2007 *Participatory action research: Approaches and methods*, Routledge: UK.

40. Ajzen, I, and Fishbein, M 1980 *Understanding attitudes and predicting social behaviour*, Prentice-Hall: Englewood Cliffs, NJ.

41. Sheppard, BH, Hartwick, J and Warshaw, PR 1988 The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research, *Journal of Consumer Research*, Vol 15, pp 325-343.

42. Ajzen, I 2005 *Attitudes, personality and behaviour [2nd Ed]*, OU Press, McGraw Hill: Milton Keynes.

43. Heimlich, JE and Ardoin, NM 2008 Understanding behaviour to understand behaviour change: a literature review, *Environmental Education Research*, Vol 14 No3, pp 215-237.

Appendix – A brief description of the schools that took part in the study

[N.B. All of the schools below, with the exception of Crispin School in Somerset, were also visited three times over the three-year period by Her Majesty's Inspectorate (HMI) to monitor institutional change and improvement.]

Alphington Primary School, Exeter
[A school of moderate size set in a residential suburb of the city]

Argyle Primary School, Camden, London
[A school of large size set in an inner city area]

Bishop Challoner Catholic Collegiate School, Tower Hamlets, London
[A large federated secondary school consisting of separate schools for boys and girls from 11-16 years and a mixed sixth form facility]
*Here the Ofsted study focused only on the girls section of the school.

Bowbridge Primary School, Newark, Nottinghamshire
[A large school in an urban area]

Crispin School, Street, Somerset
[A large 11-16 school in a small market town]

Durham Community Business College and Fyndoune Community College
[A federation of two moderately sized 11-16 schools about five miles apart, set in small rural communities]

Glebe School, West Wickham, Kent
[An 11-16 school for pupils with multiple moderate learning difficulties]

Glebelands School, Cranleigh, Surrey
[An 11-16 school of moderate size set in a small market town]

Meare Village Primary School, Meare, Nr Glastonbury, Somerset
[A small school in a rural setting]

Moorside Community Primary School, Halifax
[A school of moderate size in an urban setting]

The Academy of St Francis of Assisi, Liverpool
[An 11-16 academy in an urban setting sponsored by the Anglican Diocese and Catholic Archdiocese of Liverpool]

Cranleigh Church of England Junior School
[A school of moderate size set in a small market town, which was also the feeder school for Glebelands School, above]

Southwood Primary School, Milton Keynes, Buckinghamshire
[A school of moderate size in an urban area]

Staunton-on-Wye Endowed Primary School, Hereford
[A small school in a rural setting]

The mission of WWF is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by:

• conserving the world's biological diversity
• ensuring that the use of renewable natural resources is sustainable
• reducing pollution and wasteful consumption.

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