

# Environmental Education in Schools: An Alternative Framework

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## **Abstract**

A piece of action research is described which involved an alternative approach to environmental education with students of 11 to 18 years. The focus of the work was outside the timetabled curriculum using the school buildings and grounds as a model for environmentally responsible management and behaviour. Emphasis was on adopting criteria which were thought to lead to long-term attitudinal and behavioural change and also those which cast the researcher in a different role and gave a greater sense of "ownership" and control to the participants. The findings suggest that this approach has a good deal to offer in a context where it is becoming increasingly difficult to influence the timetabled curriculum yet where teachers and students feel that the environment is of great importance.

## **Résumé**

Cette recherche-action témoigne d'une approche alternative en éducation relative à l'environnement, impliquant des élèves de 11 à 18 ans. Les activités se sont déroulées en dehors de la grille horaire du curriculum et le milieu même de l'école - bâtiments et terrains adjacents - est devenu le contexte du développement d'un modèle de gestion et de comportement responsables à l'égard de l'environnement. L'accent a été mis sur l'adoption de critères jugés aptes à induire un changement durable d'attitudes et de comportements, à donner au chercheur un rôle différent et à permettre l'émergence d'un sentiment d'appartenance et de contrôle chez les participants. Les résultats laissent croire qu'une telle approche peut être féconde dans un contexte où il devient de plus en plus difficile de modifier la grille horaire du curriculum et où toutefois les enseignants et les

élèves croient que l'environnement est de grande importance.

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Environmental education in the school curriculum has experienced a similar recent history in the UK to that of many other countries in the world. It has been part of the timetabled curriculum in secondary schools in the UK (students aged 11 to 18 years) for many years (Gayford, 1986; Goodson 1993) and yet it has signally failed to become established in the way that most environmental educators would have hoped (Gayford, 1991).

Environmental education emerged as a recognised area of the curriculum in the UK over 25 years ago. In secondary schools it was treated as a separate subject under the title of either environmental studies or environmental science (Goodson, 1993). Here it was in competition with established traditional disciplines. As a result it was generally marginalised, being taken by a small minority of students, frequently those of lower ability. This is hardly surprising since there is considerable evidence that new subjects find great difficulty in becoming established in the school curriculum. This is especially the case with interdisciplinary subjects, such as those that are environmentally based, which are usually accorded lower status than other disciplines, particularly those considered to be more rigorous and with apparently a stronger theoretical basis (Layton, 1972).

Following the Education Reform Act of 1988 in Britain there was a radical review of the formal curriculum where it was generally considered that the most appropriate approach to environmental education was to treat it in a cross-curricular way. The recommended method was to ensure that it was embedded into the subject matter of many of the traditional disciplines (National Curriculum Council, 1990a, & 1990b). However, there was never a statutory requirement that environmental education should be part of the general entitlement of all children, neither was it supported by either the assessment process or the new framework for inspection (Office for Standards in Education, 1993). The most common result was that those aspects of environmental education that were strongly related to geography or science were taught mainly from the point of view of the associated cognitive aspects and the

important affective elements tended to be neglected. Generally the approach to environmental education has been to assume a direct and somewhat linear relationship between knowledge, understanding and awareness of environmental issues and the way that this brings change in attitudes and subsequent behaviour, despite the growing body of research evidence which shows that there are other important factors to be taken into account (Marcinkowski, 1993 and Matthews, & Riley, 1995).

It is also notable that a recent wide ranging survey of schools in the UK (Saunders et al, 1995) showed that school teachers, including the senior management team, feel that environmental education is indeed broader than the cognitive content and that the affective elements are an essential or very important part of the education of all children. In fact, compared to other cross-curricular areas environmental education was second only to health education in the importance that it was given within the survey. On the other hand they also felt that there was little time or scope in the current climate of change in education to provide more environmental education in the formal curriculum than is currently undertaken, nor had they any plans to do so. This was no doubt prompted mainly by the emphasis on frequent student assessment in the context of the formal curriculum.

### **The Study**

The experiences in the UK over many years have shown that it has become increasingly difficult to influence the timetabled curriculum in ways which enable the essential purposes of environmental education to be realised. In the light of this it was felt that a radically different approach to the introduction of important elements of environmental education into schools would be worth attempting and evaluating. In this article a piece of action research is presented which casts environmental education in a different context. The aims were to address the issue of improving understanding while at the same time encouraging participation with a view to bringing about behavioural changes. Studies by Hungerford and Volk (1990) have shown that effective environmental education, with the purpose of causing lasting behavioural change often depends upon a number of features. Using these findings and those of others a general set of objectives for the project were devised as follows:

- knowledge and understanding and awareness of environmental issues in themselves are not sufficient for there to be effective changes in the behaviour of learners; participation is an essential part of the process.
- if the main emphasis for environmental education is in the timetabled curriculum it will tend to become marginalised or restricted to cognitive aspects; therefore it must extend beyond this into the life of the school.
- the experience of learners should be over an extended period of time.
- learning should begin with what is familiar to the students and build on this to enable them to relate their learning to impacts at national and global levels.
- there should be a strong emphasis on ethical aspects of environmental issues.
- all of those involved in the process, and this should include all who work in the school, should feel a sense of ownership of the process.
- there should also be emphasis on interpersonal and citizenship skills.
- the process should aim to increase the locus of personal control (Marcinkowski, 1993), which is related to what Hungerford and Volk describe as empowerment.

Also, it was decided to adopt enquiry and appraisal methodologies based on participatory appraisal approaches developed mainly by extension fieldworkers (see for example WWF International, 1993). These methods have grown out of dissatisfaction with some of the more commonly used modes of enquiry, such as formal questionnaires which are often over-long and suffer from distorting non-sampling errors or visits by researchers to institutions which have the likely outcome of superficial contact, frequently with the elite of the institution. The aspects of the approach that were adopted for this piece of research are based on Chambers (1992) and they are as follows:

- local knowledge of the school and the personalities involved would be used,
- there would be a willingness on the part of the researcher to listen rather than inform and to maintain a “low profile” in the enquiry,

- the programme would be capable of flexibility and change and, as far as possible, under the control of the participating schools,
- the researcher would act as a facilitator to those in the schools who would develop their own learning, present their ideas and take “ownership” of the outcomes,
- there would be a sharing of ideas between the researcher and those in the schools,
- analysis, as far as possible, would be devolved to those working in the schools.

Taking all of these principles as a starting point it was decided to investigate and develop an approach which used the school buildings and grounds as a model for environmentally sensitive management and through this to promote reflective practice and involvement on the part of the teachers as well as students and also, hopefully, parents, governors and other members of the local community associated with the school. The thinking behind this was that in order to achieve the aims of the project it would be necessary for all of these people to participate actively and cooperatively and in an enlightened way. There were, therefore, strong, broad educational implications embedded within the project, with emphasis on partnership, participation and empowerment.

To put this project into context it should be understood that there have been examples in the UK of various attempts to promote environmental awareness starting with the school estate (WWF UK & Learning Through Landscapes, 1994; Baczala, 1992). These initiatives have usually focused on the teachers; sometimes they have related to the timetabled curriculum at other times to audits of school management practice, often involving checklists with critical questions from which it is expected that those carrying out the audit will make further follow-up studies. The present study built upon these ideas but especially concentrating on aspects of the school outside the timetabled curriculum and encouraging close participation, even sometimes control, from students.

### **The Participating Schools**

Four contributing schools were identified, each accepting the set of principles on which the action research was based and willing to be involved for a period of about six months. It was generally

acknowledged that those who were most closely involved with the school, and this usually meant the teachers and the students, were in the best position to initiate activities which would promote the aims of the project within their own institution and to develop the most appropriate management structure to support this process. The role of the researcher was to facilitate, encourage, advise or observe but not to take a lead in organising the school-based activities or to make critical comment. An essential part of the understanding was that the activities should not make any further demands on the timetabled curriculum that was compatible with the National Curriculum. This in practice meant that most of the work would be undertaken outside of normal lessons usually at lunchtimes, after school and sometimes at weekends. Each school developed its own management and development structure and a framework for evaluation was negotiated with the added explicit objective of this functioning as a vehicle for reflection on practice. The approaches of the four schools were each somewhat different and they are worth describing. They are briefly characterised as follows:

- Senior management team coordination (1)
- Coordination by a regular class teacher (2)
- A round-table consisting of staff, students, maintenance staff and parents (3)
- Central involvement from the governing body (4).

(These are numbered schools 1, 2, 3 and 4 respectively in reporting this study).

There were many ways in which the management styles and the activities in the schools showed similarities. However, the different ways in which the process was initiated, introduced to those involved and developed across the school, and the influence of the various personalities who took part all had a marked effect on the outcomes. These cannot be ignored but they are often difficult to evaluate. Prior to the beginning of the activities in the schools there was an opportunity for the researcher to meet each of the nominated school contacts and to negotiate what was expected and to obtain some common agreements. Among these was an expressed desire for some guidance over the sort of environmental issues that may be appropriate to include in the work. This was requested in order to assist the planning teams to make an effective start, to establish some basis for comparability between the groups and so that one

school could learn from the experiences of the others afterwards. It was considered helpful if schools, in the first instance, focused on five areas to include: energy use, water use, recycling, use of construction materials in the school and transport. A summary list of aspects which could form the basis of the activities with each was drawn up as follows:

- *Energy use:* Use of energy in the school - the costs - energy conservation and management - the types of energy generally available and their suitability for different purposes - local and global environmental impacts - how energy is generated or converted and transmitted - economic and ethical issues - ways of bringing about relevant changes in personal behaviour and institutional management related to energy use - monitoring change.
- *Water use:* conservation and management - sources of water - local impacts - water treatment - national impacts - changing patterns of water use in society - effects of climate on the water cycle - economic and ethical issues - ways of bringing about relevant changes in personal behaviour and institutional management related to water use - monitoring change.
- *Recycling:* Types of recyclable materials used in the school - organisation and management of recycling in the school and community - cost benefits and the environmental impact of recycling - ways of encouraging recycling behaviour - recycling processes and manufacturing - economic and ethical issues - ways of bringing about relevant changes in personal behaviour and institutional Water use in the school - amounts used - costs involved - management in relation to recycling - monitoring change.
- *Construction materials used in the school:* Review of a selected range of materials including wood, plastics and other building materials such as bricks, concrete and stone - sources of these materials - fitness for purpose - alternative materials - manufacturing processes - environmental impacts both local and global - economic and ethical issues - monitoring repairs and renewals and costs.
- *Transport associated with the school:* Review of the types of transport used - purposes and distances traveled - use of renewable and non-renewable fuels - costs - measures of

efficiency of journeys - health and safety issues -local and global environmental impacts - economic and ethical issues - ways of encouraging personal behavioural change, institutional policy and management related to transport- monitoring change.

All agreed that these would form a core of their work. Some could decide to cover these aspects broadly, others to confine themselves to a restricted range of aspects within each and to explore examples in greater depth. The coordinators from the schools were reminded of the aims of the activity and encouraged to give each of the eight stated aims equal importance in their programmes.

A set of evaluation objectives were negotiated at this stage on the understanding that a) they were provisional, b) there would be opportunities to add to them or change them later, c) they would be seen as helpful in providing guidance during the project, d) they would encourage reflection and possibly make it easier to identify general principles afterwards.

#### *Evaluation criteria*

The criteria finally adopted are as follows:

- The extent to which the activities in the project either complemented work in the timetabled curriculum of the school or acted as a distraction.
- Was there an increase in knowledge and understanding, for example of the life cycles of common goods and services used in the school?
- The extent to which the activity raised awareness to environmental issues and the impact of individuals and communities on the environment. These may be issues on a local, national or global scale.
- The extent to which the activity enabled or encouraged students to consider and discuss the ethical aspects of their own behaviour and that promoted by the school towards the environment.
- The extent to which all of those associated with the project felt a sense of ownership for their enquiries.
- The extent to which it developed a) interpersonal skills and b) citizenship skills.



- The extent to which the activity helped students to increase their locus of control. This may relate to direct personal action or appropriate action to bring about change within the institution using democratic processes.

*Styles of Management in each school*

*School 1.* Where the senior management team took a leading role in the project, meetings were convened and chaired by one of the deputy head teachers. Those present included class teachers, student representatives of the different year groups and sometimes caretaking staff. Work began with an audit of the school to identify those things that were already being done and areas where particular attention was needed. Year groups negotiated specific tasks which were reported back to the central committee. A bulletin board was set up in the school and information posted regularly. The work culminated in an exhibition at the school with parents and other members of the local community invited. Students were centrally involved in setting up the exhibition, its promotion and presentation.

*School 2.* The school that adopted an approach where a regular class teacher coordinated the activity also held regular meetings. These involved a central team of enthusiastic teaching staff and some senior students. Members of this central team of teaching staff and senior students worked in pairs to coordinate the activities of classes throughout the school. There were regular briefings and reporting back sessions with small teams identified in each class to take a central role in the dissemination of information to the rest of the school. Information was exchanged through school assemblies, posters and class log books which were regularly displayed. There were reports to the governors at each of their meetings and recommendations were prepared for the attention of the senior management team and the governors.

*School 3.* Where the round table was adopted a school council was formed with senior students as chair, secretary and publicity officer. Representatives of the teaching staff were involved as regular members of the round-table discussion. Caretaking staff and some parents were invited to contribute. A news sheet was instituted which facilitated the dissemination of information and

there were year group committees to organise the activities of as many students as possible. The activity was concluded with an environmental week in the school in which there were events outside of class time focused on aspects of the work.

*School 4.* Where a member of the governing body was centrally involved a number of local professionals and some interested amateurs were invited to attend an inaugural meeting. A steering committee was set up consisting of representatives of the governors, senior management team, class teachers, students and parents. Task-groups, representing members of the different interests of the steering group were organised. Their function was to each focus on one of the agreed topics. These task-groups also had the role of enlisting the cooperation of students at all levels in the school. A particular feature of this approach was that it purposely set out to recruit students from different year groups into each team. From this it was expected that younger students would learn from their elder colleagues. Each team was expected to gather sufficient people to assist in fulfilling its task. They were also expected to develop activities which would enable them to satisfactorily enquire into their chosen area and then to make whatever presentation or concluding activity they considered appropriate. The outcomes here were varied and ranged from a piece of drama, a collection of writings, an exhibition and a report to the head teacher and chair of the governors with recommendations.

### **Some particular outcomes**

At the end of the project each school was invited to provide an evaluation based on the criteria set out above. It was generally agreed that from each school there would be nine individual evaluative returns, one would be an agreed response from all of the teachers involved, another from the representatives of each of the year-groups (a total of seven per school), and one from the senior management team, who may wish to consult the governors and the parent representatives. Thirty six returns were received. The data was not subjected to rigorous statistical analysis as this was not considered appropriate. A good deal of this was self-reporting using a check-list with no agreed scale and respondents were advised not

to try to use the whole range of the scale provided, but rather to respond simply as they felt about the way that the activity had promoted or encouraged the particular aspect identified in the criteria provided. However, it was hoped that it would be useful to compare the general responses of each group involved and to see whether there were general patterns that emerged.

Each group assessed the level to which they considered their school had achieved each of the seven evaluation criteria for the project. For each they gave a score on a five point scale, with a score of five for excellent and one for a poor level of achievement. There were too many individual findings from the study to report all that was found. Many of these were probably particular to the institution and the personalities involved to have special significance. It was notable that there was generally a high level of enthusiasm for the activity which extended over the entire six month period of the project. There was also a high level of involvement from students right across the schools.

The results of the returns are summarised (See Tables 1, 2 and 3). Respondents were also encouraged to make individual comments against any of the items.

### **Some of the most useful findings**

Overall, every group within all of the schools considered that the criteria had been met effectively. There was no wish to bring in any significant modification to the original criteria which had been negotiated. The lowest scores were given by the students, but even here scores and comments reflected a strong feeling of involvement and perhaps heightened critical awareness of the whole process. Comments such as "we should have been allowed to continue for much longer so that the results would be more reliable," "we needed more technical advice and time to follow up some of the issues" or "we learned a great deal about important everyday things and how we can change our behaviour to effect global issues but we still felt that we had only just begun," were fairly common.

Generally it was felt that it was difficult to relate the cognitive elements raised in the project to topics that were being covered during the normal course of the timetabled curriculum. This was not considered to be a significant disadvantage but where the teachers

Evaluation Criteria		School			
		1	2	3	4
1.	Complementing the formal curriculum	3	3	3	3
2.	Knowledge of <i>life cycles</i> of goods and services	4	5	3	4
3.	Raising awareness to environmental issues	4	5	3	4
4.	Encouragement of discussion of ethical aspects	4	5	3	4
5.	Ownership of the enquiries	3	5	4	4
6a.	Development of interpersonal skills	5	5	4	4
6b.	Development of citizenship skills	3	3	3	3
7.	Increase in locus of control	4	4	4	3

Table 1. Evaluation Scores of the Senior Management Team in each School.

knew what was going on in the activities it did give them the opportunity to make reference to it during timetabled lessons when appropriate. In fact it was thought that it could lead to rather an artificial or contrived situation if during their timetabled classes teachers were continually making reference to the topics being covered in the activities of the project.

Where aspects of life-cycle analysis of commonly used goods and services were introduced those involved found this to be a good way of integrating the activity to wider environmental issues and to move from the local situation to national and global considerations. They felt that here a good deal of useful learning took place related to relevant knowledge of everyday matters as well as providing a

Evaluation Criteria		School			
		1	2	3	4
1.	Complementing the formal curriculum	2	4	3	3
2.	Knowledge of <i>life cycles</i> of goods and services	4	5	3	4
3.	Raising awareness to environmental issues	4	5	4	5
4.	Encouragement of discussion of ethical aspects	4	4	3	4
5.	Ownership of the enquiries	3	4	3	4
6a.	Development of interpersonal skills	4	5	5	4
6b.	Development of citizenship skills	3	4	3	3
7.	Increase in locus of control	4	4	4	3

Table 2. Evaluation Scores of the Class Teachers involved in the Project from each school.

valuable introduction to economic and ethical considerations. One teacher summarised the comments of several others by stating that when these aspects of the activities were addressed the project became especially “alive.”

Awareness of environmental issues was raised by the way that the project was designed. Relevant knowledge was introduced as a natural consequence of the activities and from this students were able to make links with their own lifestyles and wider global issues. The use of energy and transport were, for example, linked in all instances with the idea of global warming, the use of hardwoods with tropical deforestation and consequent reduction of biodiversity. Some groups even became preoccupied with these issues, almost to

Evaluation Criteria		School (mean scores)			
		1	2	3	4
1.	Complementing the formal curriculum	2.2	3.2	2.4	2.6
2.	Knowledge of <i>life cycles</i> of goods and services	3.5	3.8	2.9	3.3
3.	Raising awareness to environmental issues	3.8	4.0	3.6	3.9
4.	Encouragement of discussion of ethical aspects	3.9	4.2	3.2	3.6
5.	Ownership of the enquiries	2.6	4.1	3.3	3.7
6a.	Development of interpersonal skills	3.5	3.9	4.3	3.8
6b.	Development of citizenship skills	2.8	3.7	2.6	2.9
7.	Increase in locus of control	3.3	3.5	2.6	2.8

Table 3. Evaluation Scores of the student year groups for each school.

the point of losing sight of their own contribution to the overall project. There was also a clear feeling that the way that environmental issues are interconnected was more fully appreciated by the students involved than by the normal classroom teaching. The following comment from one of the teachers summarises the dilemma felt by many of those involved. "It was difficult to set boundaries to any of the activities. One thing led naturally to another. This was stimulating but at the same time made it difficult to manage."

Although it was explicitly stated at the beginning of the project that the ethical implications must be part of the agenda all reported that these naturally emerged as the work progressed. This approach

provided a platform for discussion of ethical matters related to personal behaviours and institutional management.

Students became intimately involved with aspects of the project which enabled them to take ownership and responsibility for negotiation and completion of particular assignments. The outcome of this was that students spent time discussing and organising with their peers, teachers and others in and around the school. Their awareness was raised to organisational and management aspects in the school and local community leading naturally to the development of interpersonal and citizenship skills.

It was considered that much well intentioned environmental education, particularly that directed towards global issues, often leaves students feeling concerned but frustrated and ultimately disenchanted since they are unable to see how their personal contribution will affect the situation. The locus of control seems to be entirely outside their capability. The approach used in this project seemed to enable teachers and students to focus effectively on this aspect and to overcome many of the problems. The process of monitoring change in individual behaviours and in institutional management was thought to make an important contribution to feelings of control.

Self-evaluation was considered to be a valuable part of the project, enabling coordinators, including students as well as the teachers to reflect on practice and identify ways in which future improvements could be made. Having the criteria constantly available provided useful reminders of the agreed objectives. Comments from students were often positive, even from the younger age groups who felt that they were able to participate more fully in the planning and implementation of the project; with a greater sense of "ownership" and understanding of the totality of the experience.

### **Concluding Comments**

One of the most obvious criticisms of the project is likely to be that, while the researcher maintained a "low profile" throughout the work, success depended on intensive negotiation with those involved at all levels. Also the approach adopted appealed only to the most committed schools and is unlikely to be attractive to many

less enthusiastic institutions. The fact that there was not a clear relationship between the approach and the traditional subjects of the formal curriculum is likely to be viewed by many teachers and probably students and parents alike, as a weakness. However, the difficulties of making a significant impact on the formal curriculum was a particular motivating factor for the project.

The importance of this piece of action research was that it provided a robust model which could be adapted to the context of most schools who wished to be involved. It could also be used to complement the strengths of particular schools. The process incorporated reflection by all who took part and it could be adapted to the type of leadership available.

Students expressed enthusiasm for the approach used and stated that they felt that they had learned a great deal. It would be worth investigating whether this actually led to behavioural changes in the lifestyle of the students at home and in the community.

A comment made by a senior teacher in one of the schools was notable and the sentiment should be acknowledged. He pointed out that one of the problems inherent in this type of approach to education is that it is likely to change people and this could lead to individuals who are increasingly at odds with the culture and context in which they work or in which they are being educated. This may be the culture and context of education of the nation as a whole or it may be that of the school or locality. This generates conflict which can lead to a sense of unease and without appropriate support from their school, home or community the experience could ultimately be seen as unhelpful. This type of activity is likely to be more effective if it is undertaken in association with other ways of bringing about attitudinal and behavioural change in schools and, more importantly, in society at large.

#### **Notes on Contributor**

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