

Earth House: Nurturing a creative response to sustainability issues - a live project

Ian Standen¹, Rachel Grainger²

INTRODUCTION

Rationale and purpose of the project

The way the planet is used now is unsustainable. Climate change from burning fossil fuels, depletion of natural resources and environmental pollution are leading to desertification, changing habitats and landscapes affecting the means of food production and quality of life for millions of people. We cannot continue to use the planet's resources without developed thought about the consequences of our actions.

Sustainability and environmental education

The Earth House Project presents an abstracted idea of our planet as a house or home to communicate to children the importance of the issues challenging us now. The key instrument of this idea being one that young children can relate to in that the home is the cherished necessity of human existence and something to be cared for.

Earth House is a holistic project; a collaboration between the University of Glamorgan, Education Business Partnership (EBP) and National Museum Wales (NMW). Its aims to provide an architectural design project that presents sustainability and sustainable development to undergraduates and primary school pupils at Key Stage 2 in the local communities. It considers the relationship between human beings and the natural environment and offers an ecological perspective on architecture via the project design solutions.

The design of the project gives the pupils a chance to 'have their say'; to test their views and opinions on these key issues to plan for the future and create a vision for something new. By collecting data and discussing solutions, school pupils and students produce action plans and designs to make a difference both in a parallel and shared learning process.

PROJECT DESIGN

Research design and pedagogical methods

The word '*sustainability*' belies the complex nature of the problems faced by mankind. How can these complex and often contradictory issues be conveyed to school children in a meaningful way?

The idea of introducing an architectural project into the classroom based on studio pedagogy was considered as an appropriate challenge and draws on complimentary constructivist theories and approaches of Piaget (1), Halprin (5) and Norman (9). This method combines both heuristic and constructivist approaches to education. It is a fundamental goal of the project that change in the natural environment is emphasised as a process and this is mapped to the idea that architectural design and planning is also a process.

These are not new ideas, inspiration for this kind of approach came from the work of such people as architect Lawrence Halprin and scientist H.E. Armstrong (2) involving investigations, active learning by discovery and authentic science. The Bauhaus method of teaching visual arts based on problem solving tasks is also relevant (3). Halprin describes the RSVP cycles as 'a balanced scheme in which all the parts are mutually related and constantly interacting....its purpose is to make procedures and processes visible, to allow for constant communication and

¹ Senior Lecturer, Architecture and Planning, University of the West of England, Bristol, BS16 1QY, UK. Phone +44 117 3281541, ian.standen@uwe.ac.uk

² Senior Lecturer, Department of Design, University of Glamorgan, Pontypridd, CF37, 1DL, UK. Phone +44 1433 482268, rgraing@glam.ac.uk

ultimately to ensure the diversity and pluralism necessary for change and growth.'

One of the project aims was to encourage learning and creativity as an active process of constructing rather than acquiring knowledge and provides instruction as a supporting process of that construction rather than communicating knowledge. It allows individual pupils the opportunity to explore their own vocabulary, with a focus on observation and close contact with the natural environment.

The project is also guided by Kolb's (7) model of experiential learning; that is to say, learning that is based on 'doing' and 'hands-on-activity'.

The children are encouraged to look for relationships among ideas, to find connections by synthesis and analysis. In a project of this nature it is important to create a classroom culture of creative thinking and invention.

The Project Brief

The framework for the project was constructed around a fictional design brief relating to the design of an 'Earth House' on a verdant site adjacent to the River Taff in Treforest, South Wales. The brief for the Earth House was described as an Ecology and Sustainability Centre to communicate sustainability issues to school children and the general public.

Undergraduates from the architectural awards at the University of Glamorgan were tasked design a building using sustainable building techniques and materials to communicate the issues of sustainability by producing a modern design incorporating many environmental aspects such as grass roofs, recycled materials, boreholes and solar panels. In tandem, 150 primary school children from five schools followed a parallel design process with the same project brief. Participating schools included Tonyrefail Primary and Ysgol yr Eos Primary in Rhondda Cynon Taff, White Rose Primary Caerphilly, Heolgerrig Primary Merthyr Tydfil and St Roberts Primary School Bridgend. Mid Glamorgan Education Business Partnership works closely with local schools and identified teachers that would be keen to work on a project of this nature.

A teacher's day at the University of Glamorgan at project the inception informed them of the aims and objectives of Earth House.

Following this the teachers, professionals and education officers were involved with the class room and field trip activities coordinated by Education Business Partnership who acted as a catalyst ensuring the partnering organisations worked closely together.

The learning outcomes were intended to develop students' understanding of issues such as energy conservation, alternative energy and construction methods and the effects of buildings on the natural environment and biodiversity in an applied and innovative way. The framework fitted into the sustainability agenda in a holistic way by allowing investigation into how plants, animals and insects are affected by man made structures and encouraging a greater understanding about energy and how to use it in a more responsible way.

THE PROJECT PHASES

The Earth House Project ran over a 4 month period and was devised in phases related to the design and learning process.

Phase 1 : The School Visits

This involved a visit to the university with an introductory talk about the project provided a senior lecturer in architecture. In conjunction and with the generous support of partner organisations such as Education Business Partnership (EBP) and National Museum Wales (NMW) a structured plan of visits and events were organised for the school pupils in advance to coordinate with key stages of the project timeline.

In February and March 2006 the school pupils attended the University of Glamorgan for a day where they were introduced to University life and carried out two structured exercises assisted by teachers, undergraduates and environmentalists.

Exercise 1 - Pupils received a brief lecture covering issues involving sustainability, followed by a discussion about related issues they had noticed in the media. The environmentalists stressed the impact of humans on plants, animals and insects and the design professional impact of the procurement and use building materials, transportation and energy. Exercise 2 – Pupils undertook a problem solving exercise titled 'the building game' designed to foster and encourage teamwork.

Phase 2 : The role of the immediate environment in stimulating children's creativity

School pupils visited the site for the Earth House to carry out, in small groups, an environmental audit and ecological assessment compiled and monitored by NMW Agenda 21 officers. The pupils recorded information using endoscopes, mirrors, magnifying glasses, binoculars and collected samples of leaves and insects. They also marked on a site plan key factors that would inform the design process such as orientation, aspect, noise and preferred locations to site the proposed building.

Two further school visits followed to partner organisations. Each school in turn visited the NMW site at St Fagans, near Cardiff, where they were shown a collection of vernacular buildings and the House for the Future Project. The children were encouraged to view these buildings as case studies of sustainable architecture to help inform their own ideas. They also undertook some 'hands-on' traditional building activities.

The second visit was made to the National Botanic Gardens of Wales (NBGW), near Carmarthen, dedicated to the research and conservation of biodiversity and its sustainable utilisation. The NBGW helped the pupils to understand sustainable development – by showing how to recycle water, burn wood to heat the glasshouses and buildings, and by visiting the "Poo Palace" how reed beds deal with human waste. Pupils were encouraged to consider the choices we have made as a society, and how the choices they make can affect the future.

Phase 3 The Design Phase

Following these visits each school undertook a day long design workshop activity, supervised by an architect, for the purpose of generating quick creative responses to the Earth House building brief.

Children were encouraged to 'brainstorm' by writing or drawing keywords and ideas associated with sustainability based on their experiences on large pieces of plain paper

The workshop focus was to relate things or ideas that were previously unrelated (8) i.e. nature, trees, insects, leaves, wood, furniture and to encourage 'bisociative thinking' by using things or ideas which already exist.' Biosociative thinking' was used by Koestler (6) to describe the notion of recognising and combining ideas to make links. In this exercise words are unrelated until the pupil establishes the relationships and finds connections or links to the subject area.

In this environment 'all ideas are acceptable in a creative situation regardless of their quality.' (8) This allows pupils of mixed abilities to have a positive input. Children were allowed to draw 'big' and colour their ideas to fuel imagination and creativity. This 'pedagogy of freedom' (4) was encouraged so that nothing is rejected during this phase. This allows the pupils to break out of existing patterns and normal classroom conventions and respond to new conditions.

RESULTS

The net impact was very positive as student groups created and sustained a dynamic classroom environment by becoming actively engaged in problem solving, sharing ideas, providing feedback, and teaching each other. The children continued to work on their designs following the design workshop over a period of 8 weeks culminating in an exhibition of their work at the University of Glamorgan in June 2006.

'It was rewarding for me as their teacher to see my class utilise previously gained skills as well

as skills gained during the project to put together their final presentation. They (as well as myself) very much enjoyed the 'sharing' of their work and effort.

Miss Karen McCarthy Teacher St Roberts Primary School

CONCLUSIONS

With regard to the creative aspect of the project the overlaying of Halprin's creative process (RSVP) (5) over Norman's (9) model for complex learning works in practice as the creative output of the children increased in line with the various project phases.

The teacher's role and behaviour was crucial to help the children accept a different way of working relative to these theories and build a classroom where problems can be solved by encouraging organic patterns of thinking, likened to how a conductor encourages and coordinates the different sections of the orchestra in to harmonious music.

Pupil perceptions of learning

One of the issues investigated was how do children relate to the wider world issues? It seems evident from this project that their knowledge of sustainability is limited to media coverage focussed around recycling and the effects of global warming. Through exposure to the richness of the biomes, chain reactions and cause and effect, the Earth House project has encouraged school pupil's intervention, invention and planning for the future. Pupils are encouraged to think creatively. This in turn allows us to reappraise the current curriculum and provide an alternative viewpoint. They also establish a greater awareness and develop ideas about the built and natural environment.

Moving forward in the sustainable curriculum

This approach provides evidence that a curriculum for 'sustainability' would involve a complex weaving of subject areas (science, geography, art and design) which have been traditionally taught as separate subjects. The Earth House combines these subjects and relates them to the built environment. By doing this and choosing a real site it reinforces the pupils' sense of engagement with sustainability issues in their immediate locality. By drawing different disciplines together in this way an attempt is made to remove the psychological barriers presented by the current curriculum, between artistic and scientific creativity and grow towards holistic paradigms.

'Incorporating many different curriculum areas the EHP provided varied educational opportunities and challenges!'

'Discussing the project with curriculum leaders since its completion, several activities have been highlighted to be included in future teaching.'

Pupils who undertook the project generally commented on how they liked everything being linked together. They liked this aspect as they felt all the visits and school based activities were working towards a definitive goal. So a sense of achievement was attainable!...they were motivated in a totally different way to consider such issues as sustainability/environment which will (hopefully) remain with them for further consideration in the future.'

Miss Karen McCarthy Teacher St Roberts Primary School

REFERENCES

1. Atherton J.S. (2005). *Learning and Teaching: Piaget's developmental theory* [On-line] UK: Available from: <http://www.learningandteaching.info/learning/piaget.htm>
2. Brock, W.H. (Ed) (1973). *H. E. Armstrong and the Teaching of Science 1880-1930*, Cambridge University Press.
3. Droste, M. (1998). *Bauhaus*, Bauhaus archive 1919-1933, Taschen.
4. Freire, P. (1998) *Pedagogy of Freedom*, Rowman and Littlefield Publishers, Inc. Lanham, Maryland
5. Halprin, L. (1969). *The RSVP Cycles: Creative Processes in the Human Environment*. George Braziller, Inc 1969.

6. Koestler, A. (1964) *The Act of Creation*, Picador, London
7. Kolb, D.A. (1984). *Experiential Learning*, Englewood Cliff (NJ): Prentice Hall.
8. Rawlinson, J.G. (1996). *Creative Thinking and Brainstorming*, Gower Publishing Company, Aldeshot
9. Rumelhart, D.E. & Norman, D.A. (1978). Accretion, tuning and restructuring: Three modes of learning. In J.W. Cotton & R. Klatzky (Eds.), *Semantic factors in cognition*. Hillsdale, NJ: Erlbaum.

List of Illustrations

- Fig 1. Interior Design 2nd year student- Site Plan and St Roberts PS Building Study Model
- Fig 2. Pupil design options for Earth House
- Fig 3a. Pupil exhibition of work at the University of Glamorgan June 2006
- Fig 3b Pupil exhibition of work at the University of Glamorgan June 2006
- Fig 4. 2nd year Interior Design study model by Giti Dallali
- Fig 5. 2nd year Interior Design study model by Michelle Scott
- Fig 6. 2nd year Interior Design site proposals by Michelle Scott
- Fig 7. 2nd year Interior Design elevation study by Michelle Scott
- Fig 8. 2nd year Interior Design scheme proposals by Christopher Williams
- Fig 9. 2nd year Interior Design scheme proposals by Rhiannon Thomas
- Fig 9a. 2nd year Interior Design scheme proposals by Rhiannon Thomas
- Fig 10. Ceremonial planting of a tree presented to the schools by the University of Glamorgan and Education Business Partnership as a finale to the project. Pictured- Keith Gillard OBE, Chief Executive of EBP with pupils and staff from St Roberts Primary School Bridgend.