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Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-School through Upper Secondary and Teacher Education

Edited by Inger Björneloo & Eva Nyberg

Education for Sustainable Development in Action
Technical Paper N° 4 - 2007
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Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-School through Upper Secondary and Teacher Education

Göteborg Workshop
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Edited by Inger Björneloo & Eva Nyberg

U N E S C O

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Preface

This publication is the product of the workshop on *Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-School through Upper Secondary and Teacher Education* held in Göteborg, Sweden in March 2006. The workshop was the second in the series of workshops emanating from the *Learning to Change Our World* International Consultation on Learning for Sustainable Development, held in Göteborg in May 2004 on behalf of the Swedish Government.

The first workshop in the series was *Drivers and Barriers for Implementing Sustainable Development in Higher Education* (Göteborg, 2005). Two more workshops are planned, which include one for Non-governmental Organizations (NGOs), with informal and non-formal sectors of the education system, and one entitled *The Role of Early Childhood Education in a Sustainable Society*.

All four workshops are intended to go more deeply into the problems identified at the major consultation of 2004 and the outcomes are to serve in the planning and preparation of the next International Consultation foreseen in 2008. The aim of the four workshops is to offer a forum for discussion of issues with respect to the UN Decade of Education for Sustainable Development 2005-2014. The invitation to the workshop in March was designed to give us, despite the limited number of participants (25), as broad and deep a picture as possible of how Learning for Sustainable Development is treated and the problems that are identified throughout the formal school system leading to, and including upper secondary level. We invited teachers, teacher educators and researchers engaged in Education for Sustainable Development. We also looked for variation in both a north-south and an east-west dimension – in other words, a multidimensional representation from a cultural, religious, economic and political point of view.

We are grateful for the rich contribution we got from all participants during the workshop and through the papers presented here. We hope that this publication will contribute to the ongoing discussion on matters relating to *Learning for Sustainable Development* among teachers, teacher educators and researchers and thus promote the development of teaching for a sustainable future.

We would like to thank Søren Breiting, Mark Rickinson and Inger Bjorneloo for chairing the workshop sessions, and Gunnar Jonsson, Eva Nyberg and Per Sund for the note taking during the discussions. We also appreciate the work of Malin Malmberg, Christer Larsson, Eva Nyberg and Inger Björneloo for the planning and implementation of the workshop. We are very grateful to Saba Bokhari at UNESCO, Paris for working closely with our editorial group in the preparation of this joint publication.

The workshop of March 2006 has been organized and financed by the City of Göteborg's School Development Unit and the Göteborg University's Department of Education.

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Opening Address

Carl Lindberg

Special Adviser to the Swedish National Commission for UNESCO
Member of UNESCO's High-Level Panel on the DESD

Dear Friends,

It is indeed a great honour for me, as a representative of UNESCO's High Level Panel on Education for Sustainable development and the Swedish National Commission for UNESCO, to be able to take part in the opening of the workshop "Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-school through Upper Secondary and Teacher Education". I am also grateful and delighted that we are able to meet here only twenty-two months after our consultation "Learning to change our world" in May 2004 in which some of you participated very actively and that we meet here already in the second year of the UN Decade of Education for Sustainable Development.

By meeting now, this conference helps in ensuring that we do not lose any time in our joint efforts to change our Pre-Schools through Upper Secondary and Teacher Education Institutions all over the world so that they are better able to support sustainable development, economically, socially and environmentally. To begin with, therefore, I would like to express my very warm thanks to the organisers of this conference Göteborgs stad and Göteborg University. The theme for this conference has been well chosen "Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-school through Upper Secondary and Teacher Education". All of you gathered here, informed, well-known and committed experts from different part of the world have important experience and a very wide range of in-depth knowledge to share with each other in the workshops, on how education from pre-school to teacher education can meet the challenges presented by the creation of sustainable development.

I have earlier had the privilege to participate and meet many experts like you in international conferences on ESD, in Russia, Thailand, Denmark, Lithuania, Canada, Japan, Korea, Germany, China and Indonesia. I have in these international conferences had the chance of meeting representatives of many of the countries in the world. They have all shown a very genuine interest in education for sustainable development, they have represented many different orientations within the field and many of them have made a great impression on me. We have really much to learn from one another and we can really inspire each other.

The political will for tackling many of the major challenges facing humanity can only be created by educated public opinion. People able to imagine the conditions in which other human beings live. People who can see the human faces behind all the statistics. Who can feel the disappointment of parents who cannot afford to send their children to school, who cannot give their hungry children food or who cannot protect their children from malaria or other diseases. What can give us hope is that, fundamentally, we all have the same human nature. This means we are able to see a potential friend in every human being. But set against this there is the failing that the Nobel Peace Prize Laureate Mother Teresa expressed in the words, "Nothing is as easy to tolerate as other people's suffering".

If humankind – we, our children and grandchildren – is to have a future fit for human beings, a future we can really look forward to, globalisation, as it continues, must aim for completely new goals. It must become globalisation with a human face, not, as now, globalisation that serves the movements of international capital. Globalisation must build on the basic principles and conventions that have been worked out by the United Nations in the sixty years of its existence. And this year we have got a chance to celebrate UNESCO 60 year of committed work for education, science and culture.

So we must create a feeling of global responsibility, from which a host of actions can grow, that can meet all the threats that the human race itself has created. This is the point of education for sustainable development.

While Education For All, according to the Dakar goals, is the foundation, in order to be effective and relevant it must also be inspired by the perspective of sustainable development. Education for all and education for sustainable development are two sides of the same coin.

The 2005–2014 Decade of Education for Sustainable Development is the golden opportunity now offered to us all – committed teachers at all levels, school and university heads, students, education ministers and other education politicians all around the world – to take serious matters seriously, to work with others to change all levels of our education systems, so that when the students have completed their education they will really possess the ability and will to work actively for sustainable development in our societies.

The governments of the countries whose heads of state and government have endorsed the Johannesburg action plan and the UN resolution on the Decade of Education for Sustainable Development must now at last take their responsibility. I am convinced that committed teachers and enthusiastic students are willing to shoulder their share of the responsibility, but this is not enough. Education ministers in all countries must feel that they are morally obliged to jointly seize the opportunity offered by the resolution on the UN Decade and to take the lead in efforts to change their countries' education systems.

I would now like to take the liberty to describe in a somewhat more concrete manner the thinking of some researchers from the Nordic countries on ESD and which also corresponds with my way of thinking.

Education for sustainable development should begin as early as pre-school so that our children can become people who show responsibility and care about others. But if we, together, are to achieve sustainable development in its three dimensions, taking into account the social and economic dimension as well, we should complement the eco-schools with ESD schools with the goal that every school will become an ESD-school. In addition to encouraging environmental awareness, these ESD schools should also consider social development, and hence justice between people, equality between women and men. They should also promote the will and ability to work for the development of a sustainable society.

This means that sustainable development must be the guiding light both in daily life in schools and in longer term planning. It is matter of encouraging pupils to become active citizens and participate in and work for social and environmental change, and a matter of creating in them an ability to act. This requires everyone in schools – teachers, pupils and school managers, together with parents and representatives of the community – to discuss and clarify how best to profile school activities in order to support the development of a sustainable society. This presupposes, of course, that the laws, regulations and curricula that schools must follow are also designed to support such developments.

One thing that is particularly important in this education for sustainable development is active pupil and student participation, so as to foster a feeling of responsibility and a will to actively contribute to the development of a sustainable society after completing their education. This is completely in line with the UN Convention on the Rights of the Child. The foundation for participation must be laid early, even in pre-school, and opportunities must be provided for it to grow by allowing children to take part in planning school activities, both in their own classes and in their own school.

The concept of participation must permeate education for sustainable development on every level. Students and pupils must be seen as full citizens while still taking part in an educational programme. They must be shown respect and care at the same time they are trained to act independently, take responsibility, consider and cooperate with others, to learn to listen, respect and show consideration to what others with differing opinions say. Students must be encouraged to express their opinions in discussions of current issues. Students must be made equal participants in the learning process.

A teacher can be seen as an adviser, the one who creates situations, clarifies aims, poses questions, which allow the student to move forward in the learning process. The individual teacher is to provide a clear structure for the schoolwork, with clearly defined expectations for student performance. But it is important not to undermine the teacher's role as a knowledge bank and an expert in his or her fields. The teacher must never relinquish his or her responsibility to lead the process.

Sustainable development must not be seen as a new field of study, but rather as a perspective that is added to all school subjects. The sustainable development perspective can then be seen as an aid for teachers to select relevant content in the educational process. It is important that, as far as possible, real problems are dealt with, problems that have an impact on students' lives and the reality and the society they live in. Problems that one can exert an influence on and which are important to achieving sustainable development both locally and globally. The work of the school must therefore also be directed towards society, to cooperation with people and organisations outside the school, at home as well as abroad.

The new ideas about education for sustainable development must be introduced at individual school level. In this, the head teachers and school boards play an important role. School managers have the particularly important task of creating an atmosphere in which every individual feels free to contribute good ideas and suggestions. They can also encourage cooperation with other schools, both nearby and further afield. But the key to success in the individual school is ongoing discussion and reflection, and an exchange of ideas and experience between pupils and teachers.

Introducing ESD as the guiding light for work must not become an extra burden for teachers and school heads, but should be seen as an opportunity to improve teaching and learning throughout the school. But schools cannot just talk about the future – they must also work for the future. Therefore it is important to reflect on how concrete action can contribute to solving or counteracting problems that stand in the way of sustainable development.

This pre-supposes, however, the development of a capacity for critical thinking and questioning, since there is no predetermined way in which to achieve sustainable development. It pre-supposes active, creative and critical citizens who are good at solving problems and conflicts through cooperation. But another important factor is the inspiration we get from other people's successful ideas.

ESD can be drawn on both in the teaching of traditional subjects through the choice of examples and perspectives that make teaching more meaningful, and also in a more problem-oriented, interdisciplinary format. Clear goals for teaching and learning must be established. In order to strengthen the process it is also important to have the help of assessments in the form of awards, such as the Green School Award, Eco Schools or ESD-school or pre schools and other certification processes, where teachers and students together can consider and assess the development of their school.

The EU programme Comenius III has created a network "School Development through Environmental Education " (SEED). They have one year ago presented very useful "Quality Criteria for ESD-Schools". It can be downloaded from: www.seed-eu.net

At the Johannesburg summit, the Swedish Prime Minister took the initiative to host the consultation here in Gothenburg to promote education for sustainable development. In his inaugural speech at the consultation entitled *Learning to change our world*, the Prime Minister emphasised the vital importance of efforts to achieve sustainable development. He underlined then and during subsequent interviews that it was absolutely essential that those who graduate from our universities as teachers, engineers, doctors, social workers, journalists, and so on, must know how to work to achieve sustainable development. He also announce his intention to propose that the Swedish Parliament should amend the Higher Education Act so that universities and colleges are required to promote sustainable development in their teaching.

This amendment of the Higher Education Act has now passed our Parliament and from February 1st 2006 Swedish universities and university colleges have to in their activities promote sustainable development.

I share of course the view that all students, irrespective of their specialisation, must acquire a good knowledge of how to promote sustainable development in their future professional lives. This can be achieved both by obligatory courses and by all subjects being taught from a sustainable development perspective – but the most important thing is that all students should be included.

I am pleased to say that the vast majority of Swedish universities and colleges – and especially our larger universities – are positive to this amendment of the Higher Education Act.

In Sweden, many university and college courses are already promoting the development of a sustainable society. But according to the analysis in the report presented one year ago by the Government's Committee on Education for Sustainable Development, this is by no means sufficient, either as regards content or the working methods employed. It is, not least, a matter of developing a capacity for independent and critical reflection and a desire for commitment to social issues. Even though there are, in theory, many great opportunities to exert influence, students must be given more encouragement to make use of these opportunities.

University managements and among them those who are responsible for teacher education must draw up action plans to ensure that education is indeed characterised by a sustainable development perspective. It would, of course, be ideal if this could happen by virtue of the keenness of university employees and students, within the framework of the autonomy traditionally guaranteed to universities. But in most cases, I believe, this work would probably be easier if university managements had the support of legislation.

The Swedish Government has, only 7 weeks ago, taken a decision that all the about 40 programmes in the new Upper Secondary School that will start in 2007 will be permeated by the perspective Sustainable Development.

The older the pupils and students get the greater their chance for participation becomes. Some upper secondary schools in Sweden have governing boards with considerable powers where pupils are in the majority. Student representatives also have considerable influence on Swedish university governing boards and use it very constructively in a way that is greatly appreciated by university leaders.

The students' own organisations are extremely important in this context. It is essential we encourage them to tackle the issue of education for sustainable development. Those who are studying in higher education today are the ones who will be building for the future. They are the ones who will have to bear the consequences of the wrong, short-term decisions that are taken today. A civil engineer who graduates this year will have an active working life until the middle of this century. A teacher who graduates this year will, during her or his teaching life, influence people who will live into the next century. For this reason, students and their organisations must have every opportunity to influence educational programmes so that they promote sustainable development.

One of the great scientists of our age, Albert Einstein, also provides support for the fundamental ideas behind education for sustainable development. The following statements about education are taken from some of his speeches. I quote:

- *The aim must be the training of independently acting and thinking individuals, who, however, see in the service of the community their highest life problem.*

- *The school should always have as its aim that the young man leaves it as a harmonious personality, not as a specialist.*

- *The development of general ability for independent thinking and judgement should always be placed foremost, not the acquisition of special knowledge.*

Education for sustainable development must consist of two equally important processes. A top-down process proceeding from a government that is conscious of its responsibility, together with its agencies, and a bottom-up process proceeding from all teachers, students and

school heads, from early childhood education to university level, based on their own strong commitment to really contribute to a sustainable future.

In order to enhance the top-down process in Sweden one and a half year ago, our National Committee proposed among other things that the Swedish Government take the following measures to strengthen ESD:

- The Education Act should be amended to specify that education will promote socially, economically and environmentally sustainable development.
- The Higher Education Act should be amended to specify that activities will promote socially, economically and environmentally sustainable development.
- School curricula need to be reviewed so they provide better support for education for sustainable development.
- Basic training and in-service training for those engaged in teaching activities in the field of education should aim to strengthen knowledge of sustainable development and how education can promote sustainable development.
- A pilot scheme should be established to provide opportunities for stakeholders in the school sector, the higher education sector and liberal adult education to produce methods to permeate the education system with a sustainable development perspective.

The two processes, the top-down and the bottom up, must be matched at other levels, for example, in towns and communities in our countries. Almost one year ago in my hometown, Uppsala, the municipal council decided that in the coming years the education system would be permeated by the sustainable development perspective. This decision will now be put into practice out in our schools. This will be made easier by the fact that Uppsala University and its teacher education programme have expressed strong support for working with education for sustainable development. Similarly in many places in our country, an ever stronger interest is emerging for really taking education for sustainable development seriously. There will be a meeting next week on the issue in the Malmö –Lund region. I think there is a good chance that some of these activities will develop into a Regional Centre of Expertise along the lines proposed by the United Nations University in Tokyo.

However, it is not enough for the sustainable development perspective to be limited to formal education. It must pervade all education that is carried out in society, including personnel training at companies and in the public sector. I am convinced that the companies and public institutions that make sustainable development the guiding principle of their personnel training will soon realise the great advantages to this approach. Their staff will feel proud to be involved in operations that aim to make a responsible contribution to the sustainable development of society. Here I believe trade union organisations can play a particularly important and proactive role. But it is not therefore merely a task for teachers' trade union organisations, which have declared through their international organisation, Education International, that they want to work for sustainable development. It also concerns trade unions in other fields throughout the world. I appreciate especially that the Swedish Teacher´s union´s (Sveriges Lärarförbund) Pedagogical Magazine´s in their copy in November last year with an edition of 234 000 copies, had the theme Education for Sustainable Development ,in which the articles were written by or presented participants from the consultation here in Gothenburg.

Being able to refer to international political agreements is of great significance if we are to succeed in our work. The United Nations Economic Commission for Europe (UNECE) strategy for Education for Sustainable Development is very important. At a ministerial meeting in the Lithuanian capital of Vilnius in March this year, representatives of more than 40 of the 55 UNECE member countries gathered to adopt this strategy, which now forms the basis of ongoing efforts. The Strategy is now also printed in all the UN official languages. (www.unece.org/env./esd/). UNECE has also appointed an expert group with the task to develop indicators on ESD supporting the implementation of this Strategy.

The EU's overall objective is to promote sustainable development. Even though education is primarily a national concern, the EU also has responsibilities in the field of

education. I am convinced that the issue of education for sustainable development should be able to play a much greater role than it does today in EU student exchange programmes.

As I said earlier the EU programme Comenius III has created a network "School Development through Environmental Education " (SEED) and presented a very useful "Quality Criteria for ESD-Schools", that I can recommend.

With the help of modern technology we can, despite the distances, continue to keep in touch and share important experiences with each other. It is my firm recommendation that we should promote links to other parts of our world on every educational level in our work to support achieving sustainable development.

Sometimes we need very good examples to explain to other what we mean by ESD. The Nobel Peace Prize Laureate for 2004, Wangari Maathai, from Kenya can help us with an example from the informal education. She received the Prize one and a half year ago for her work for Sustainable Development, Democracy and Peace. In her Nobel Lecture she told us what her Green Belt Movement had done. I quote: *We developed a citizen education program, during which people identify their problems, the causes and possible solutions. They then made connections between their own personal actions and the problems the witness in the environment and in society.*

And she finished her speech by saying: *In the course of history, there comes a time when humanity is called to shift to a new level of consciousness, to reach a higher moral ground. A time when we have to shed our fear and give hope to each other. That time is now.*

I myself would like to conclude by saying, that by support from ESD, humanity can reach this new level of consciousness, this higher moral ground. This is inspiring for all of us, here and now. Therefore, we must use the Decade as the golden opportunity, given us by the United Nations, to work very hard, together, all over our world, to through education reach this new level of consciousness and this higher moral ground for humanity.

It is the responsibility of us all, through hard work, to act to ensure that this education really comes about in all areas of the world. This is something we should promise one another as a result of this conference.

Therefore I wish all of us success in our common important work for implementing ESD in pre schools, schools and in the teacher education in our countries.

Thank you for your attention

Executive Summary

I-Introduction

Twenty-five guests from all over the world had been invited to the international workshop in Gothenburg in March 2006, to discuss Drivers and Barriers in Preschool, through Upper Secondary and Teacher education concerning Education for Sustainable Development, ESD. The aim was to put the knowledge base forward and to clarify which issues should be highlighted at the coming international consultation in Gothenburg 2008 concerning the Decade of Education for Sustainable Development. The participants came from all levels of the educational system.

The mixture of people from twelve countries with many different points of departure, depending on their occupations, cultural backgrounds and the socio-economic status of their countries, was interesting and challenging. During the course of the three days' discussion, it was clear however that this meeting could not fulfill the diverse expectations of the participants. Our conclusion is that this diversity must be seriously considered, and be a point of departure for the planning and realization of the coming consultation in Sweden, mentioned above. The purpose of this paper is to make visible some of the pluralism of different perspectives on education for sustainable development. This pluralism, which, during the workshop seemed to hinder progress, could through this be turned into a forceful driver instead of remaining a frustrating barrier.

II-Pre-Workshop Preparation

The workshop was started off by asking each participant to contribute beforehand with a paper on one of the three themes and questions below:

Theme 1: Drivers and barriers in school and teacher education structures

- How can education for sustainable development be understood and what new challenges does it bring to teachers at all levels?
- How does the traditional discipline-based structuring of knowledge and research affect the implementation of learning for sustainable development?

Theme 2: Values and ethics in education for sustainable development

- What role do values and ethics play in education for sustainable development and how should they be handled?

Theme 3: The role of educational research for sustainable development

- What role does educational research for sustainable development play in the process of crossing barriers and creating drivers for implementation of education for sustainable development among practitioners in pre-school, school and teacher education sectors?

Drafts of the papers were submitted before the workshop and were available to each participant through the website of the workshop. As a preparation for the workshop the participants were divided into three groups, which were maintained throughout the meeting. The groups were arranged with the aim of diversity rather than similarity regarding profession, nationality and gender. Each participant was asked to read the papers written by their group members before the workshop. The discussions during the workshop were based on the three themes above.

Whereas the organizing committee requested papers to be written under three pre-determined themes, namely, a) School and Teacher Education Structures, b) Values and Ethics in Education for Sustainable Development and c) The Role of Research of Education for Sustainable Development, the papers submitted by participants covered a fourth and equally valuable domain, which has been called d) Implementing Education for Sustainable Development – Examples and Ideas.

III- Issues, Observations and Reflections from the Workshop Proceedings

There was no true encounter about ESD issues

During the formal discussions, it was obvious, generally, that arguments ran parallel many times and were not, in reality, parts of true communication. Conversations, during lunch or coffee breaks, sometimes gave a hint of what people really wanted to express, their main concerns. Some participants from developing countries left the workshop frustrated, which could be understood through expressions such as "this conference has not dealt with real life issues or real life situations". Questions like why there is no specific ESD content were not answered. Many delegates needed concrete results to take back home for future discussion, such as guidelines for implementing ESD. People from the developed countries, went on with academic issues such as how to change environmental education, EE, into ESD.

Sustainable development vs. education for sustainable development

Sustainable development, SD and education/learning for sustainable development are very often confused and this was unfortunately not clarified at the beginning of the workshop. Sustainable development concerns everybody in a society: environmental engineers, economists, health promoters etc. An engineer can teach about sustainable development issues but not be interested in learning. A teacher could be very interested in learning but not about sustainable development. Education/learning for sustainable development focuses on the learning process in or for a sustainable society. One can be interested in sustainable development but not in learning or vice versa (Scott & Gough, 2003). All these different expressions, about the contemporary work for the future, need to be discussed thoroughly. Most of the participants were interested in both, but it is necessary to try to keep the concepts separate. When SD and ESD are mixed up like during this workshop, it is very difficult to make progress.

What do we gain and what do we lose through education?

"What do we gain and what do we lose through education with respect to SD?" was one of the questions, which emerged out of the discussions during the first day of the meeting. Another was: "ESD is the solution to what type of problems in your country/school/neighbourhood?" A third was: "Is gender equality always in favour of a sustainable society?" These questions all show that there is no consensus concerning either the understanding of Education for Sustainable Development, the ways to implement it or even if implementation is always wise. In other words it was questioned if it is possible to solve major problems in one part of the world in a certain way, through inputs from other regions of the world, since the conditions, traditions, problems and political contexts are so different.

These questions also revealed that the values underlying the ESD concept like the democratic right for everyone to have an education, or gender equality, is not being supported by all and that, according to some participants, fulfilling the aims of these does not necessarily lead to a sustainable society. On the contrary, it was argued, that education for all and gender equality may hinder sustainable development. The former was explained by the fact that an educated person will have a chance to get a well-paid job, and therefore obtain a higher standard of living, which will inevitably lead to a greater impact on the environment. Concerning gender equality it was explained that if education should lead to changed roles in families, the security of children might not be maintained and social structures of stability, within societies, would fall apart. The message was that we should educate for a place in society, to comply with a system. In that way education would lead to a sustainable society. As opposed to this, the northern point of view was that education in itself must have an emancipatory role and that education for sustainable development must be a democratic process, not a political tool to achieve a certain goal.

The above discussions clearly demonstrate the ethical dimensions of ESD. They are discussed by Öhman (in current publication), who considers some of the most critical questions in sustainable development to be whom we ought to take into account in our

strivings for a sustainable future and to what extent, as well as whether we are only responsible for sustainable development in our own part of the world or throughout the whole world, and whether everybody has equal rights to the same welfare.

Two different understandings of the concept ESD

The discussions also revealed that the concept of ”Education for Sustainable Development” is interpreted in two different ways. These two interpretations must be understood in relation to the culture and socio-economic status.

In many developing countries ESD is often about providing all its population with a basic education. Sustainable in this sense is the strength of the society or country to maintain long-term funding. One delegate expressed the sustainability issue as a responsibility for teachers, ”teachers have to sustain education”. Education, itself, is the main aspect to keep sustainable. Education is a crucial condition for a long-term development of a local society or municipality. It was obvious that it was sustainable education that many people from developing countries were expressing opinions about, in this workshop.

The social and economic issues are often naturally embedded in the work of smaller communities to create a better future. A wise use of local resources can also sustain education and contribute to fulfilling some of the parents' dreams for their children. Education is a way out of poverty and an important way of creating better life conditions for future generations.

In developed countries the ESD issues are something completely different. The starting point for education is that education is available to everybody. This is especially true for the Nordic countries where even the study at university level is free. In this educational scenario ESD is a pedagogical project where a traditional way of teaching environmental education, is the object of change. From being a pedagogical endeavour with a body of subject content and methods, EE is to be transformed into a lifelong educational approach, ESD (Breiting, 2000). This type of teaching approach will in the long run permeate all parts of society and support different kinds of learning. In other words, the ESD discussion is about changing a school subject EE to a more general teaching approach - ESD -, which could be useful for the entire society. Lifelong learning is a necessary element of a society in the process of achieving sustainable development.

IV- Lessons Learnt

All the different and more or less implicit dimensions in the workshop included issues pertaining to: developed - developing countries, urban - rural, different classes of society, governmental- research- school level, need to be made visible for all in order to promote and make fruitful discussion possible, for most participants. The pluralism of perspectives is a vast resource if they are made visible. If these different expectations are not openly discussed however, there will not be a true mutual understanding or communication, no encounter will arise and mature.

The backgrounds of the participants are of course much richer and more diverse than the dimensions described here. We are all born into a language and within a culture, with all the differences they make. Culture is something that seemed to separate people in these discussions. But it could be turned into a strong unifying force, bringing people together and getting them to start talking about ESD, in relation to culture. This could be a very relevant subject or theme for an ESD consultation. How can we uphold cultural diversity in the age of globalisation? This is an important contemporary issue (UNESCO, 2004). How is it possible to strengthen minority cultures in this current wave of western culture, which is spreading across the world?

Pluralism should be a forceful driver, not a barrier

According to many researchers in environmental education, EE, and education for sustainable development, ESD, pluralism is one of the main characteristics of ESD (Sandell, Öhman, & Östman, 2005). In order to make this pluralism a fruitful driver it must be made transparent through open-minded democratic discussions (Öhman, 2004).

We believe the lack of deliberative discussion was the main reason why the workshop did not develop into a close 'encounter' between the people from different parts of the world, who all are deeply interested in ESD related issues. Intentions and expectations of the workshop were very positive but there were no common issues, issues relevant to everyone, to get people to begin communicating. A compilation of the participants' different expectations gathered before the meeting, would probably have been very useful. It could have offered guidelines for unifying themes or brought forward major differences in understanding ESD or different views concerning ESD.

V- Recommendations

At the summing up at the end of the workshop there was a strong request from some participants that as part of the preparation for the next consultation a short introduction concerning ESD should be produced. It should include the formal background to the Decade for Education for Sustainable Development, some issues behind the ESD concept[1], such as democracy as well as some issues concerning the development of ESD in a country. The tension between ”guiding principles” and allowing for local context should be discussed. It was claimed that this could meet some of the needs for having something concrete to take back home and be a support for the participants' work in their own countries. Others felt that a key agenda item should be the development of an ”ESD Research Strategy for the Decade” and that participants should receive tasks to solve together rather than talking about special issues. It was further argued that one result of the meeting should be the establishment of partnerships between countries in order to forward the work of ESD. It was also considered, by some participants that coming to an agreement on an evaluation program, is important, in order to check whether the work with ESD is making progress or not. This should be done in relation to global guidelines. It was also suggested that the link between the preparatory workshops should be made explicit, and that continuity should be ensured by drawing on the network of participants from these workshops. To make progress during discussions it was suggested that work should be done both in small specialist groups and in broader groups. Many stressed that the explicit aim of the consultation must be established in advance.

VI- Conclusions

Were the aims of the workshop achieved? To some extent, drivers and barriers were identified, but it was obvious that the understanding of ESD differed a lot, which made the discussions more difficult than was previously expected. One reason for this was probably the diversity of participants invited with respect to background, profession and place in society. The participants were not official representatives of their countries and therefore presented their drivers and barriers in relation to their professions and social and cultural contexts. The outcome of and experience gained from this workshop may therefore be closer to real life issues, but also more complex, than would have been the case with official representatives from each participating country. This pluralism must seriously be taken into account for coming meetings, and be taken advantage of in a much more fruitful way than was the case on this occasion. It also seems necessary to discuss the ethical dimensions of ESD such as the democratic aspects. Education for all or not? Welfare for all or not? Gender equality for all or not?

The purpose of the future consultation 2008 should be in the spirit of ESD and should not make attempts to define ESD in any general terms; such attempts are doomed to failure or do not add anything specific to the concept. Education research however could give some 'guidelines' for ESD as a teaching/learning approach: it ought to be democratic, strive for equality, empower students, make students active participants in developing their own education, work with real life issues, purpose driven (Breiting, 2000; Huckle & Sterling, 1996; Sandell et al., 2005; Schnack, 2000; Sund, 2006, in prep.). These guidelines are described from a western perspective. But 'global guidelines' for ESD, which should be more or less independent of culture, are very hard to formulate. Participants in this workshop showed very

1 An historic overview of the concept of sustainability, written by David Chapman, one of the participants at the workshop, has been provided by the organizers in the Annex.

clearly that democracy and equality are not something that can be taken for granted, as something good in every society. Social structures within societies and cultural differences make these discussions very difficult at a global level. If they also include SD, for societies, regions or countries, then it will be very hard to lead the consultation or workshop forward in a fruitful way.

The participants in the consultation must be given the opportunity to bring up *their* questions and purposes with ESD. These could concern the development of rural areas or how to promote ESD in a national school system. It could also be about ESD and it's relation to culture, education in general or gender aspects. Many educational researchers stress that long term social issues are important in ESD discussions (Fien, 2004; Huckle & Sterling, 1996). How is ESD supporting progress towards specific social goals within the country, the municipality or in the schools? How is ESD promoting students to become active participants working with real issues in a democratic way (Hart, 2000; Schnack, 2000)? There are many urgent questions about ESD that are interesting for many people independent of nationality and many other dimensions.

It is within this lifelong learning process that an ESD conference could and ought to create new encounters between people from different parts of the world (Wickman & Östman, 2002). People gather and are joined together by their mutual interest and wish for a better world, for all people. One of the researchers said during the workshop: "Sustainable development is a democratic issue. It is not about a special kind of society that we are heading for. It has to be an ongoing democratic discussion and thus be a continuous process." Our opinion is that the ultimate purpose for this type of conference must be to guarantee an ongoing communication between people in the ESD process in all parts of the global society. With this purpose in mind the differences between people, the pluralism, will evolve and grow to be a strong driver and not a barrier. The democratic process of ESD will proceed and develop, slowly but surely.

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1. Is 'Sustainable Development' the core of 'Education for Sustainable Development'?

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Abstract: What is the core of Education for Sustainable Development (ESD) and how to avoid that ESD becomes everything good in school and in reality not more than a new terminology without much innovative power for education?

Introduction

Is 'Sustainable Development' the core of Education for Sustainable Development? - This is a good question to reflect on when we want Education for Sustainable Development (ESD) to be successful. First and foremost it is important to realize that there isn't a simple relationship between the concept and phenomena of Sustainable Development and the idea of Education for Sustainable Development (ESD). In this contribution I will shortly develop some thoughts on how to identify core content and give examples of approaches in the possible pedagogy of ESD.

Where to focus?

At the international conference in Gothenburg in March 2006 'Drivers and Barriers for Learning for Sustainable Development in Higher Education' one of the themes were 'How can sustainable development be understood and what new challenges does it bring to teachers at all levels?' This is a nice and quite obvious formulation but from a pedagogical perspective it might be much more fruitful to turn it around as: 'How can *development that isn't sustainable* be understood and what new challenges does it bring to teachers at all levels?' The reason for the usefulness of such a formulation is connected to a number of aspects: At present we have development that definitely isn't sustainable and it is important for everyone to know the mechanisms behind what shapes development locally and globally to be able to be influential.

It is also well known that the concept sustainable development is a so-called 'ill defined concept' (see ESDebate) and a situation of sustainable development is impossible to identify as such and be hundred percent sure about it. It is much easier to identify aspects of development that aren't sustainable and try to be innovative to create alternatives that are more sustainable. What is even more important is to realize the normative nature of sustainable development without any given solutions. Sustainable development (SD) is about common societal issues with plenty of conflicting interests and contesting values.

The many negative and depressing aspects of present unsustainable development are already a big challenge to teachers in its many forms and accordingly important to deal with, too. The contribution of ESD to a strong civil society seems to be mandatory in every country, and the competences that should be developed are best understood as empowerment or 'action competence' (Jensen 2005, Schnack 2003) linking the ability to cope with identified present problems with possible wanted futures and adequate actions. All this requires new approaches and understanding by the teachers and their advisors (Jensen 2005).

How to be successful with Education for Sustainable Development?

If we want our school system to be successful with Education for Sustainable Development the implementation of ESD should make it *easier* and more satisfying to be a teacher - *not* more difficult or more frustrating. Also for the pupils and students ESD should make it better and more meaningful to be in the school.

On the contrary, what teachers experience every time a new problem arises in the society with political problems to cope with is this, 'The school must solve the problem'. The view on the school as a system in a clear hierarchy supports the idea that societal problems can be solved by addressing the problems to schools through a top-down approach in different wrappings, - just to mention a few examples of areas: Obesity, anorexia, smoking, suicides, inappropriate nutrition, AIDS, other health issues, inequality, environmental problems, multicultural issues

etc. depending on country and culture. And then it is stated that the children can also teach and persuade their families to comply with the wanted change in behaviour.

This way of thinking easily gives troubles in school for teachers as well as for their pupils.

- The mandatory curriculum becomes even more crowded.
- Teachers feel overburdened with new challenges to engage in.
- Teachers feel they are never doing enough of what is expected from them.
- Only the most committed teachers of a specific field (the 'fire souls') become truly engaged in the new challenges of an area.

The result is that it will be a permanent and unsatisfying struggle to keep such important areas and issues alive and in good shape for the daily life of the school.

To avoid this problem we could think of ideas as follows related to the teachers for ESD:

- Can we make use of ESD as a new 'tool' for the teachers to fulfil expectations they already are fighting with related to their 'traditional' curriculum?
- Can we use ESD as a catalyst to facilitate needed changes at the school level and by that facilitate a more satisfying working situation for the teacher?

For the pupils we could think of the following:

- If ESD could help the pupils to learn more of the traditional subject matter.
- If ESD could make the learning situation of the pupils more meaningful and stimulating.
- If ESD could facilitate better social relations for each pupil and enhance the self-esteem of each.

What about the 'curriculum of ESD'?

In general ESD is perceived as diffuse and difficult to get a firm grasp on and accordingly difficult to distil the essence of ESD easily becomes everything good and in fact nothing especially new, except the term. Such an 'umbrella term' has its limitations.

As ESD is typically seen as an area to be integrated in the existing curriculum we can ask if it really matters if teachers develop a useful concept of ESD. For example in Denmark we haven't used the term ESD that much until lately and most teachers will look in another direction if you ask them about their engagement in ESD – They don't have any reflected view on it. At the same time the Danish curriculum guides etc. have most aspects of ESD quite clearly described and formally implemented for general school. As such Danish students are encouraged to be participants, to be involved, to be responsible, to let their voice be heard, to know about the issue, to be critical and to make a difference. At the same time development issues and inequality are traditional aspects to deal with to some extent in the Danish school. So why bother about a missing general understanding and concept of ESD among Danish teachers, or among other countries teachers?

On the other hand the existing literature about ESD often highlights the need for the integration of aspects of different subject areas into an understanding of issues related to development, including social, economic and ecological aspects. This is also needed in most other societal issues to be proper dealt with in schools, but in my experience there is a special need for a more coherent and prominent idea of ESD among teachers if the outcome shall meet the challenges our young people are facing in the future related to development that isn't sustainable.

In an international conference about ESD development (Jensen 2005, p. 23) the situation of ESD was summarized among the concluding remarks: "With regard to action competence and empowerment it was stressed that ESD is a process, which enables learners to: 1) Critically reflect, 2) Detect bias, 3) Clarify their own values and 4) Develop their action competence. In other words, action competence is viewed as the overall aim of ESD and of education in general, which at the same time bridges ESD with school development. One of the crucial preconditions for developing action competence is participation and it was emphasised that a

concept of genuine student participation does not exclude the professional, on the contrary it implies a responsible and competent teacher who is able to challenge and support students and to provide the necessary insight and knowledge for their learning processes. This also leads to important challenges for teacher education and teacher educators, as they need to improve the skills of future teachers for involving participatory approaches without losing the content of ESD."

These remarks add to the point of view that 'the curriculum of ESD' isn't well identified by a number of content categories. The content might be important but the more important is how the students get the frame for working with the content, i.e. what is the level of participation? In this understanding ESD is about development issues and how students can develop empowerment to fight such issues related to their wishes and values.

Coming back to the question about the idea of 'sustainable development' the conclusion might be that for the students' own development it is much more stimulating that they by themselves develop a concept of what they regard as 'sustainable development' than they exercise alternative existing definitions of sustainable development.

A conceptual approach to focus on central issues of development in the spirit of ESD could be to help students work with imaginary conflicts between present and coming generations related to the use of natural resources. Such work isn't difficult as even 10 years old children can easily deal with the expected interest of 'their grandchildren' related to present problems (Breiting, Mayer and Mogensen 2005).

On such a concrete level we can try to break up sustainable development seen as a phenomenon: The challenge is linked to the fact that nobody will be able to declare a situation for a sustainable development situation, before afterwards. This drives our attention toward looking for alternatives and to compare these from the perspective of their potential contribution to sustainable development. This is a meaningful approach in teaching and learning and there will be many valuable concepts and relationships to deal with.

Some ideas for the specific curriculum of ESD

The concept of sustainable use of natural resources: As a main ingredient of sustainable development must be the sustainable use of natural resources. This is an area feasible to work with: investigate current use of natural resources and how the future looks for a continued use in the present way. Also include the effect on the potential use of other resources.

Equal access to natural resources: Related to the point above the equal access to natural resources now and in the future is a central focus point in ESD.

Focus on conflicting interests in the use of natural resources: This is a main focus point of environmental education and equally important for ESD.

Focus on conflicting interests in the use of natural resources between our grandchildren and us: On the overall level the opposing interests between future generations and the present generations are an obvious focus point. Does this focus help us in ESD? – Yes, it will in many countries add real value to the traditional curriculum.

Focus on health related to inequality and to environmental aspect: Without a broad and positive concept of health it is difficult to deal meaningfully with issues of sustainable development.

Needs and wishes: The normative nature of needs (and of cause of wishes) and links to their cultural context.

The difference between reversible changes and irreversible changes: All kinds of human activity will influence the environment, but some changes will be forever.

In the concrete approach to teaching, it is useful to have the following in mind:

If we use ESD of children with the aim of solving SD issues we will fail: The less we 'use' children and the more we empower children the more successful will ESD be.

Develop mental ownership to the issues of SD: One of the most important tasks of ESD will be to help students develop mental ownership to issues not immediately related to their personal daily life.

Keep moral solutions for yourself: The less moralistic ESD is the more ethical the learners will be.

Real actions count: Learners' real actions should be an important content of ESD at all levels - in the understanding as actions developed by the learners and addressing their own identified problems – This will develop their long lasting action competence.

How to organize an ESD project?

How to bring these more theoretical perspectives into the classroom in a coherent way? Before I explain one approach it is worth realizing that more or less everything a well-functioning school is teaching could be seen as part of ESD. Most of the traditional parts of the curriculum will bring the young people into the local culture and equip them to function as individuals and as members of the community. To learn to read and write is important for every individual and as a member of the society, just to take an obvious example. But it isn't meaningful to include such basic learning in the concept of ESD. To avoid that everything can be argued for as ESD we have to limit ESD to teaching and learning that is directly related to development issues. In other words an issue-orientation is needed in the content and approach. In practice it can take the shape as a project organized teaching sequence.

Experience with the following teaching sequence for ESD projects has been very positive independent of the age groups of the pupils. Some comments will follow after the outline:

Class work/ Theme: Investigating the use of a local natural resource.

1. Preparation in class:

Focus on a 'natural resource' e.g. FRESHWATER. Developing own conceptions and add more perspectives and needed factual knowledge and understanding. Preparation for group work: How to interview local people about the use of the selected resource in old days, today and about the future use. Which questions to ask? How to introduce the work of the group? How to record the answers? etc.

2. Investigation in the local community:

a. Groups interview older people in the community about how the resource was used in older days and their feelings about this and about the present situation.
b. Interview of active people in the community about the same resource: How is it used today? Which problems are there etc?
c. Ask all for their expectations for the future related to this resource: What do people expect will happen? What would they *like* to see happen?

3. Back in class:

a. Groups elaborate on their findings: Summarizing their interviews.
b. Groups elaborate on their own observations: Summarizing their own impressions.
c. Each student group prepares 4 big drawings / posters on big pieces of paper, e.g. each 60 cm x 40 cm in 'landscape format'.

Each drawing should express the interpretation of more or less the same part of the local community, but as the group understand 'The Past', 'The Present', and 'The future, as people expect it to look like' and The future as people would like it to be', all related to the selected resource.

4. Presentation in class:

When each group is presenting their results for the class the drawings are displayed related to each other like indicated in the fig. 1.

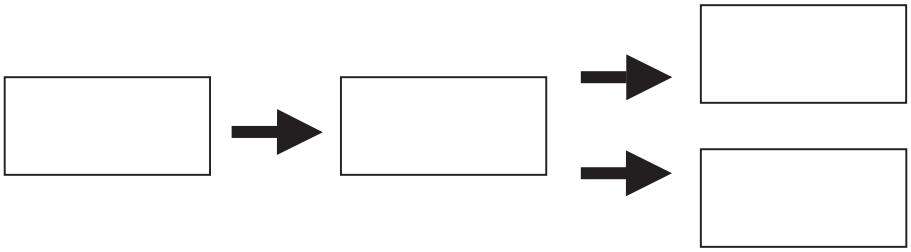

Fig. 1. Each group's big drawings are displayed in such a way that the present situation is displayed in the middle, the past before to the left and the possible futures to the right over each other as alternatives.

Such a display on the indicated background will be rich in impressions from the groups' investigations in the local community. Social, environmental, economic and cultural aspects will together with the self biographic contexts many of the interviewees will explain will form a natural mix of the complexity of development issues related to the dependence on local natural resources, including health aspects. Issues and differences in opinion, values and interests will be possible to elaborate further in the class as a background for the students to dig further into selected aspects of the issue and to make up their own mind of how the future should look like.

From my experience different interviewed persons often express the same concern about development, but feel unable to do something about it. If the class calls for an exhibition inviting all the interviewed people, families, and some officials and just explain their findings, this can in many cases function as a catalytic role of the class in their local community. It can end with an important social recognition of the achievements of the students and as such as a good contribution to their further development of action competence. The investigation of the class will in some cases be followed by some real changes in the community that can be traced back to the engagement of the children.

But for pedagogical reasons such a project should be seen by the teacher as mainly an educational effort and not as an effort to support present development in the society towards a more sustainable situation. This seeming contradiction is based on the fact that the less the teacher lets the students be 'treated for sustainable development' and the more the students are helped to be respected for their own views and findings, the stronger will their future commitment to issues of sustainability develop.

Conclusion

Experience has shown that it is possible to give education for sustainable development the function of being an innovative power in a school and for the individual teacher. By including parts of the 'traditional curriculum' in a functional way in a project as described, it is possible to enhance the learning situation in a meaningful way for the students and to help the teacher become more engaged and satisfied with the daily challenges at the school.

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2. Some Conceptual Issues in Education for Sustainable Development

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Abstract: There is a strong international, national and regional mandate for Education for Sustainable Development (ESD): the United Nations has gazetted a 'decade of education for sustainability; sustainability is Australia's top research priority area; and there is increasing local concern about specific sustainability issues like the effect of the sea change movement on Australia's coastal communities. In this paper I will consider two contemporary conceptual issues in ESD: the contested nature of the field itself; and the relationship between traditional discipline-based educational structures and ESD. In addition to these conceptual issues, I will draw on a recent practical example of a sustainability project in raising some questions concerning the distinguishing characteristics of sustainability issues that perhaps ought to be addressed in ESD.

An international, national and local mandate for ESD

ESD is now a highly visible discourse in the field of education at a number of levels:

- Internationally, we are in the second year of the United Nations Decade of Education for Sustainability;
- Nationally, the topic An Environmentally Sustainable Australia is National Priority Area #1; and
- Locally there is a rapidly increasing interest in sustainability of coastal environments in light of population shifts – this is the so-called "Seachange" phenomenon as evident in the work of the National Sea Change Taskforce collaborating with Local Government and Planning bodies.

One key concept within the discourse of ESD [http://www.gdrc.org/sustdev/un-desd/intro_un-desd.html] is that of the interplay of environmental, social and economic interests evident in any environmental issue. Another is that of 'inter-generational equity', which put simply is concerned with ensuring that future generations of inhabitants of the planet have continuing, undiminished access to natural communities, with all the advantages that attend such access. The obvious implication is that current generations have a duty of care towards the environment to ensure that it remains available for the enjoyment of future generations.

In the *Description of Designated National Research Priorities and Associated Priority Goals,* a concern with these two key sustainability concepts is evident in the statement that "Natural resources have traditionally fuelled our national and regional economies. They have the potential to generate further wealth and employment opportunities in the future. But our natural resources and biodiversity must be used on a sustainable basis so that the benefits continue to be enjoyed by future generations." (http://www.arc.gov.au/grant_programs/priority_areas.htm p. 1).

Locally in Australia, recent reports of the National Sea Change Taskforce identify some key challenges facing coastal communities around Australia, including the continuing increase in demand for infrastructure and services, the impact of local human population growth on the coastal environment and the character of coastal communities, the need for a sustainable approach to tourism, and the need to review the roles of each level of government (*Geelong Advertiser* 31/1/2006:p.13). The Taskforce report claims that 'we face significant damage to coastal environment and the loss of identity in many coastal towns. In short, this can be seen as a sustainability issue implicating both natural and human communities in coastal regions. In the short term, this coastal sustainability issue will become more intense, as Australia's generation of baby boomers approach retirement age. Demographers predict that a further one million people will be heading for Australia's coastal regions in the next decade." (*Geelong Advertiser* 31/1/2006: p.13)

If the idea of sustainability as inter-generational equity of access to valued natural communities is to have any meaning, we need to recognize the importance of the next

generation of potential inhabitants – we need to engage and prepare for the role that our current school-age children will play, and to understand the factors that will shape these roles.

With rapid social/environmental change now part of the physical and conceptual landscape for children in coastal areas (for example), it is particularly important and appropriate in this international *Decade of Education for Sustainability* that research focuses on the relationships between local curricula and learners' evolving constructions of local sustainability issues in fragile coastal environments. This is consistent with one of the aims of Education for Sustainable Development movement (ESD): Public understanding of the principles behind sustainability: "ESD has a major role in furthering the discussion of sustainability itself and the evolution of the concept from a vision to its practical application in culturally appropriate and locally relevant forms." (GDRC 2005)

> *Question: what is an appropriate relationship between the globally relevant consideration of ESD and the opportunities and perhaps obligation to apply the concept practically in ways that are culturally appropriate and locally relevant?*

Within the Mandate: Contesting definitions, descriptors and priorities in ESD

As implied above, there is a significant and growing discourse in the field of environmental education concerning status, meanings and even the politics of the topic of 'sustainability'. For example, the international journal *Environmental Education Research* recently devoted two entire issues (Volume 7 Number 2, May 2001; and Volume 8 Number 1, February 2002) to the topics "The Language of Sustainability" and "On the Possibility of Education for Sustainable Development", and these articles in turn refer to a number of other publications on related topics. This aggregation of scholarly work, while reinforcing the mandate for ESD, also demonstrates that the concept is far from unitary in nature.

Within these and other articles, there is evidence that sustainability issues share characteristics with other environmental issues in that they are, by definition, essentially contested. Their meaning as issues resides in differences of opinion among people with differing development interests that reflect different values (Robottom 1987). Issues consist in the debates and arguments among stakeholders in the outcomes of the issue, and issues cease to exist when differences of opinion are resolved. In this sense environmental and sustainability issues are entirely human/social constructs that have meaning within particular social, cultural and political contexts. The experience of local projects shows that an engagement of environmental issues needs to be located within a consideration of a range of social, cultural and political concepts such as equity, participatory democracy, and generational and inter-generational human rights.

Not that these difficult discussions, debates, arguments and contestations are undesirable or in some sense pathological. They are the means by which a more complex and sophisticated understanding of the respective community's notion of sustainability is negotiated. The difficult nature of these negotiations is attested by Barkin: Sustainability is not 'simply' a matter of the environment, economic justice, and development. It is also about people and our survival as individuals and cultures. Sustainability… is about the struggle for diversity in all its dimensions (Barkin 2000).

Most descriptions of sustainability speak of its three elements – ecological/environmental sustainability, social sustainability, and economic sustainability. One of the most fundamental issues raised in the discourse on sustainability is the apparently problematic relationship among these three dimensions, with the seemingly essential tension between ecological and economic sustainability receiving much attention. Sauve (1998) for example suggests that sustainability, given its joint ecological and economic interests, is predisposed to cooptation by/within an economic rationalist discourse. Some representatives of business, industry and commerce argue that it is necessary to put economic sustainability ahead of ecological sustainability because environmental regulations and conservation principles are expensive and businesses need to be profitable to be able to afford them. John Elliott (2006) believes that 'there is a danger that education for sustainable development will largely be perceived in terms of the economic goals of society; that is teaching students about the need to conserve environmental resources for the

sake of sustaining the economic growth on which their future income and wealth potential may depend'. For some authors, the seeming illogicality of a single concept entertaining two competing interests of economic and ecological sustainability is sufficient for them to discard the notion of sustainability as unworkable, rejecting the proposition that there ought to be an 'education for sustainability' at all (Jickling and Spork 1998).

Question: is there a danger that ESD may come to be framed in terms of serving the economic goals of society, and how may this be avoided?

How does the traditional discipline-based structuring of knowledge and research affect the implementation of ESD?

One interesting observation that can be made on this discourse *about* sustainability is that it is largely theoretical and seemingly not informed by actual instances of projects concerned with sustainability-in-action. The arguments are largely theoretical appraisals of statements and policies, and the logical coherence and implications of these.

In terms of definitions, descriptors and priorities in ESD, I suggest that one of the issues that ESD has to resolve is its relationship with the historically more established field of environmental education. The relationship is a vexed one: ESD seeks to establish its warrant on the basis of a critique of EE practice for insufficiently engaging social and economic considerations in its treatment of environmental issues, while at the same time seemingly less able to define its own practices on the ground in a way that can be seen to achieve what EE has allegedly failed to do. In documents of ESD (United Nations 2002, UNESCO 2004, de Haan & Harenberg 1999) it is argued that EE was too restricted to questions of ecology and nature protection, and that only ESD is able to broaden the perspectives including economic and social demands.

One of the conceptual difficulties that we need to consider is to sort out the claims and counter-claims encountered in ESD's attempts to establish its warrant – to clarify relationships among ESD and EE at the levels of language, organization and practice.

Schematically, how do the language, organization and practice of ESD in the Decade relate to those of EE 25 years earlier?

What is the nature of the interactions among these elements of environment-related work…			
	Language of ESD	**Organisation of ESD**	**Practice of ESD**
Language of EE			
Organisation of EE			
Practice in EE			

Some questions:

1. Is there any significant different in the UNESCO discourse of EE in the 70s and 80s and that of ESD in the second year of the Decade?

2. How is school and community practice in ESD in the Decade different from that in EE of the 70/80s – is there a definable qualitative difference?

3. What does ESD need to do to define itself clearly and improve and enact its warrant?

In a similar way to EE, ESD needs to sort out its relationship with science education. Although environmental education had its roots in science education, attempts to teach environmental education *per medium* of conventional science subjects – to accommodate

environmental education within a scientistic worldview – are arguably counterproductive to environmental education as an educational reform. The argument behind this assertion is an epistemological one -- that a form of education seeking to promote the traditional science disciplinary characteristics of objectivity, rationality and truth is by itself inadequate to accommodate and represent the highly complex nature of environmental issues. If the purpose of science education is taken as promoting a key element of the scientific method – that of eradicating the influence of human and social values through processes of conjecture and refutation in a critical open society – and achieving outcomes that are "scientific" in the sense of being independent of historical, social and cultural conditions, then science education is capable of misrepresenting the unavoidably value-laden, contextual nature of environmental issues, and is therefore a limited vehicle for promoting and implementing environmental education. In fact, we might consider whether the reverse might in fact be the case – that environmental education might provide a useful conceptual framework for teaching science (and other discipline-based subjects) in an integrated way. Environmental education might be a pathway to integrated science education curriculum.

Question: How does ESD relate epistemologically to science education?

Learning from practice: the CADISPA project as sustainability-in-action

CADISPA is a long-term project based at the University of Strathclyde in Glasgow and coordinated by Geoff Fagan. According to a recent (December 2001) brochure on the CADISPA project, CADISPA is concerned with developing a definition of sustainability that will be of help to local people and to the economic community. The emphasis on sustainability and localness is clear, and is echoed in the following statements:

For CADISPA, all economic and social regeneration must stem from within a framework of sustainable economic, environmental and social factors.

CADISPA builds social capital by non-formal education, active engagement and local decision making.

CADISPA uses standard community development techniques to enable people in individual communities to own, understand, and act upon their own preferred sustainable agenda (CADISPA 2001).

The aim behind the CADISPA model is to help local people identify their development needs and support them whilst they both pursue their collective agenda and form the partnerships with the Economic Development Agencies and the local authorities (Hampson and Fagan 1997).

CADISPA builds rural partnership groups by seeking agreed entry into local communities and working always with existing community groups, describes and publishes with them a development agenda for their locality. CADISPA starts with local people and their vision of the future – gradually building the picture and extending the consultation and partnership base until each feels confident with both the potential development, but also with its appropriateness, extent, cost and cultural ambience (Hampson and Fagan 1997).

At its simplest then, CADISPA seeks to assist local people make their community more sustainable. There is a clear participatory, power sharing interest expressed in the comment that "people are central to the identification and prioritisation of their own local agenda[1] [i]. It is they who prioritise and decide on their own local development".

[1] It should be noted, before proceeding, that this emphasis on 'the local' is itself not uncontested. There are some concerns expressed that emphasising local developments might actually distract attention from broader economic and political forces whose influence ought also to be recognised:

Recent discussions in development have moved away from holistic theorisation towards more localised, empirical and inductive approaches. In development practice there has been a parallel move towards local 'participation' and 'empowerment', which has produced, albeit with very different agendas, a high level of agreement between actors and institutions of the 'new' Left and the 'new' Right. We argue that, by focusing so heavily on 'the local', ...manifestations tend to underplay both local inequalities and power relations as well as national and transnational economic and political forces. Following from this, we advocate a stronger emphasis on the politics of the local, ie on the political use of 'the local' by hegemonic and counter-hegemonic

Thus CADISPA is linked with (draws from and potentially makes a contribution to) the enduring environmental education discourses of *sustainability* and *participatory community-based approaches,* and to the literature that critically appraises these discourses. Owing to the fact that it seeks to "build social capital by non-formal education", CADISPA relates to educational learning theories, and because its activities involve local people in conceptualising and developing their own projects, it has the potential to relate to the specific educational learning theory of *constructivism.* It is reasonable therefore to assess its contribution not only to the remote communities it engages directly, but also to the broader field of environmental education, and to do this by exploring the nature of its links with these discourses.

It is clear from the kinds of environmental development projects within which CADISPA plays a part that sustainability is complex, contextual, contentious and difficult. Most of the projects take place within contexts that:

- Have multiple governance;
- Have only partial agreement concerning a 'common development vision';
- Require serious negotiation among environmental, social, cultural, commercial and political interests;
- Experience communication problems within planning groups and between these and the funding agencies;
- Have expertise limitations in terms of both numbers of willing participants and range of professional capacity;
- Express differing understandings of the concept of sustainability;
- Have an enduring sense of optimism and energy; and
- Have a commitment to the principles of participatory process and sustainability (however these are understood).

In short, these sustainability projects are a struggle, but a struggle deemed worthwhile by participants. It is also clear that communities engaging the idea of sustainability in direct, concrete ways undergo significant personal development through their struggles and that in most cases this struggle is not just a learning experience but one that has permanent concrete outcomes. Sustainability is a difficult concept, but the message from CADISPA is that it is possible to make it work, and this process, though difficult, is itself educative. And it is particularly educative about the essential tension inherent in sustainability projects – the tension between economic and environmental interests. In CADISPA projects, this issue expressed itself in this way: that to the extent that the projects succeed in generating the revenue required to enable economic sustainability, there is the potential that the very qualities (isolation; sparse population; peace and quiet…) that attracted residents to their remote sites in the first place will be threatened – economic sustainability needs to be reconciled practically with environmental sustainability. Unfortunately perhaps, in most of the instances I studied, it seemed that in the inevitable tension between economic and environmental interests, the former ended up being privileged. I remain unconvinced by exhortations of win-win scenarios.

Some questions:

- What conceptual understanding of sustainability is adopted and enacted in particular contexts?
- In what sense are equity and empowerment important considerations?
- What level of public involvement takes place, and how is this guaranteed?
- Is representation among communities wide and equitable?
- How is the recurring issue in CADISPA resolved – the issue that to the extent that the projects succeed in generating the revenue required to ensure economic and social sustainability must be reconciled with the potential that the very qualities (isolation; sparse population; peace and quiet…) that attracted residents to their remote sites in the first place

interests MOHAN, G. and K. STOKKE (2000) Participatory development and empowerment: the dangers of localism., Third World Quarterly, 21(2), pp. 247-268..

will be threatened. In short, steps to ensure economic sustainability have the potential to threaten environmental/social sustainability.

- In what sense has a redistribution of political and economic power taken place in particular settings?
- What is an appropriate role for project field-workers in sustainability projects?

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3. Desires and Resistances as Drivers and Barriers to Environmental Learning and Sustainability: A Canadian Perspective

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Abstract: The idea that learning for environmental sustainability can be conceived in terms of drivers and barriers foregrounds the inherently political nature of education. Curricula are socially and culturally constructed; content and pedagogy are matters of political debate and value-laden decision making, often with government prescribing and/or promoting particular approaches as strategic interpretations of research evidence. In these circumstances, discussions about 'drivers and barriers' cannot ignore underlying issues such as 'what counts as curriculum pedagogy' and 'what counts as learning' within particular sociopolitical contexts. The purpose of this paper is to (re) consider these issues in light of our experiences researching small pedagogical changes in environmental learning strategies.

The paper argues that recent research on learning foreshadows a shift in thinking about what counts as curriculum practice as well as what assumptions underlie such practice. An example from our research within a particular local context is used to illustrate how drivers and barriers operate in subtle and inconspicuous ways, as desires and resistances, shaped by discourses and situated in teachers' sense of agency/identity/self within that context. Changing curriculum and pedagogical practices is challenging precisely because it means first learning how to learn who we are as learners and teachers in ways that can account for those desires and resistances that often manifest themselves as contextual drivers and barriers.

Introduction: New Learning Theory Applied to EE/ESD Curriculum

My focus on learning as a way to approach drivers and barriers of environmental education/education for sustainability (EE/ESD)-based experiences is intended as an opening for considering how different framing assumptions work to create differences in perspective that influence practice. Understanding learning is always linked to a range of broader values and purposes of curriculum and pedagogy as a complex of value-laden social and political processes. We use the term loosely and arbitrarily in everyday conversations, as a slogan with assumed meaning. Learning, however, is not what it used to be. Recent articles in *Educational Researcher* disclose deeper debates of broadened conceptions of learning (e.g., Greeno, 1997; Sfard & Prusak, 2005). These debates implicate several long-standing aims of environmental education related to the value of participatory approaches, active inquiry in community-based social and environmental problems, and socially critical forms of environment-related education. They trouble assumptions about what counts as education in ways that resonate with the philosophical/pedagogical bases of EE/ESD.

The struggle to enact EE/ESD in schools has often been linked to several common visible barriers such as time, lack of resources, lack of expertise/knowledge and curriculum demand. The roots of such barriers are grounded in traditional views of learning and pedagogy (Palmer, 1998; Sterling, 2003). As Huckle (2003) suggests, the pedagogical base for ESD, particularly in terms of learning, has not been properly considered, in light of new and varied forms of both ESD and learning. Such pedagogical and learning issues are subsumed by even more basic issues (assumptions) that impede or distort how learning is conceptualized. Whereas learning is now understood primarily in terms of both individual cognition and social participation (see Sfard, 1998), dominant educational discourses frame what really counts pedagogically in terms of formal, acquisition, or product learning; informal, skills or social/situated learning is of lesser value.

Hodkinson (2005) traces this distinction (which prejudices social community learning and experiential/contextual learning) to philosophical dualisms of thought that distinguish mind/body, individual/social, process/product, and formal/informal learning. Western educational traditions have tended to privilege mind as superior and as the prime focus for learning (propositional/disciplinary knowledge). ESD, with roots in environmental education, tends to value embodied, social learning. For Hodkinson (2005), the argument that to be an

individual person is to be a social person implies a view of learning, more comprehensive than cognitive or constructivist, as inherently embodied and social (a view that neither denies nor privileges the individual). Evidence of the value of integrating social with individual dimensions of learning is now explicit in classroom research from traditional disciplines such as mathematics and science. Grounded in research in developmental and cultural psychology, new learning theory argues persuasively that classroom cultures should be approached differently.

Applied to the school, learning research now acknowledges that both products and processes of learning are intimately intertwined as social, cultural and value-laden activities based on learning metaphors that are as much social and participatory as constructivist or cognitive (Donovan & Bransford, 2005; Rogoff et al., 2003). Viewed in this context, former distinctions, privileging teacher-led pedagogy, de-contextualized curriculum and standardized assessment (as barriers to EE/ESD) become more arbitrary, as preferences. However, it remains for EE/ESD researchers to formulate appropriate strategies and approaches to address drivers and barriers that can be conceived in terms of more subtle desires and resistances implied in these preferences. Our research on the Canadian Youth Forum for Sustainability (YFS) represents our attempt to understand how drivers and barriers that appear to operate may be more accurately represented as desires and resistances of those participating in school experiences.

Context: The Youth Forum for Sustainability

A view of learning as embodied, as individual and social, as process and product and as an integration of formal and informal implies that local knowledge is fundamentally important when considering drivers and barriers to EE/ESD. In studying the Canadian YFS we wanted to understand how ‘acquisition’ and ‘participation’ as metaphors for cognitive and social dimensions of this broadened view of learning interrelate and interact in local contexts (see Barrett, Hart, Nolan, and Sammel, 2005). The YFS experience creates conditions for high school students, teachers and community partners to take action to develop more sustainable communities. Responsibilities for learning were assumed by students working with teaches and community members in school action teams thus shifting the power dynamics within student-teacher relationships and emphasizing social interactions as instances of participatory learning well beyond formal high school settings. Forums or conferences brought participants together to discuss these issues of pedagogy and learning.

To understand these issues, our case study-based research generated narrative accounts (through focused observation and interviews) as evidence of both participant learning (i.e., drivers) and challenges (i.e., barriers) encountered. Our accounts reveal a variety of perspectives on the value of highly interactive teaching-learning situations, of shifting power relations and of rethinking curriculum goals and pedagogical strategies. For example, experiential learning outcomes of the Forum emerged from a variety of non-classroom-type activities such as schoolyard naturalization, culture-jamming, improving nutrition of school food, and organizing school environmental conferences. Each of these activities involved both individual and social learning processes such as planning, communicating, organizing, decision-making, as well as leadership skills and public relations.

Questions were raised, often by teachers themselves, about the roles and responsibilities of teachers who embody dominant storylines and values associated with contemporary understandings and traditional social actions of schooling. Questions such as, “What counts as learning?” and “Whose learning?” and “How to evaluate?” challenge dominant conceptions of what counts as knowledge and as schooling in traditional places where transmission of content is commonplace. Such challenges seem to manifest themselves more as internal desires and resistances than external drivers and barriers to how social learning dimensions, both cognitive and participatory, could be interpreted and assessed in local situated experience. Thus, the educative value of YFS experiences can be assessed in terms of both individual (cognitive) and social interactive (participatory) practices in which students and teachers engaged. Students were credited for assuming roles in planning local school/community projects, compiling and presenting scientific as well as social data, working through logistics with community resource

people, reporting and communicating findings and cooperating positively with each other and with community people in new and less well defined learning environments. Individual learning practices were viewed in terms of their contributions to group processes, as applications of their acquisition of knowledge and skills within real contexts of social practices.

In reporting on the YFS process as a way of coming to understand why environmental and sustainability education are marginalized within Canadian schools, Barrett et al. (2005) raised concerns about typical barriers related to time, curriculum expectations, safety issues, size and complexity of classes, and lack of resources. However, as these barriers play out in teachers' lives, they are perhaps better construed in terms of what they represent, that is, as the material effects of culturally and historically produced storylines of learning, or as narratives that have (re) produced particular notions of what it means to be 'teacher' and 'student' at each level of education. For example, teachers who attended the YFS appeared caught in contradictory educational storylines about what it means to be teacher or student. As mini-narratives in our cases illustrate, teachers talked about balancing authority and legal responsibilities with working to foster independent learning and critical and creative thinking in their students. Their struggles suggest that dismantling underlying discourses of teacher-as-authority is difficult and more an internal resistance, that appeared spontaneously in spite of their desire to change, than an external driver or barrier.

Drivers and Barriers (Re)Considered as Desires and Resistances

The argument of the paper is that drivers and barriers to change may be reasonably conceived in terms of their tacit underlying discourses. Following Davies and Whitehouse (1997), no matter how much they may desire to change their views of learning (e.g., toward more participatory approaches) or their pedagogical practices, neither teachers nor students can easily engage different sociocultural/political narratives of schooling and be expected to immediately take them on as their own. There is significant power invested in conventional ways of positioning oneself as 'teacher' or 'student,' investments supported by institutional if not societal sanction. Disrupting these investments represents an insidious and persistent 'barrier' or resistance to the taking up of discourses beyond the norm (Whitehouse, 2001). It is not easy to see how socially constructed meanings work to produce us as educators. As we become more conscious and perhaps critical of such internal drivers and barriers, we may gain understanding of how such discourses operate invisibly as common sense—natural or normal dominant learning structures—in powerful controlling, yet invisible, ways. The challenge becomes one of learning to see or finding ways of rendering more visible the conventional power structures that operate as subtle barriers or private resistances to change.

Questions of how culture may enter individual identities and reinsert itself in collective actions have become a focus in social theory and social learning research. Rethinking barriers as resistances to ESD activity in schools involves expanding research agendas to consider what teachers and their students bring to school (i.e., their positionalities) as well as their communities' cultural models of understanding of 'social realities' and educational strategies that shape learning. In pursuing the YFS experience as researchers, our interest is in how deeper structural context works to construct identities as multiple subjectivities. In these terms, our research challenges these traditional educational discourses that have provided many resistances to EE/ESD activity (see Lemke, 2000; Nasir & Saxe, 2003). Learning, in this sense, implicates questions of how collective discourses have worked to shape personal worldviews and how personal ontologies may be implicated in (re) constructing collective discourses (see Payne, 1999).

These ideas, familiar amongst learning theorists and developmental psychologists, have yet to work their way into the applied practical world of education. Early signs of change in language may be found in discussions where identity is viewed in terms of trajectories through discursive space such that an individual may come to be recognized as a certain kind of person (see Gee, 2001). The idea that people can also tell themselves and others who they are and try to act as though they are who they say they are (see Holland, Lachicotte, Skinner, & Cain, 1998), although somewhat essentializing, serves to foreground links to ideas of identity-making as a

social (communicational) practice rather than extra-discursive entities that one merely represents or describes. Perhaps, as teachers and students actually involved in EE/ESD action, finding ways to represent their stories told about what they do to change things in their communities may even work to change the feelings and actions of others.

Conclusion

While many of the findings of our inquiry relate to participant learnings (e.g., content, values, empowerment), the focus for this paper was on apparent contradictions between desires/intents and practices of sustainability education. Whilst Canadian high school teachers and students working toward environmental sustainability may appear to be shaped by sociocultural and institutional barriers as socially constructed understandings of the purposes and processes of school, we suspect that the social and political impacts of certain participatory experiences may actually shape (or drive) the educational process to the extent that some institutional barriers are overcome. Case studies of EE/ESD activity of the YFS illustrate the dynamic learning nature of (social) action projects in the sense of the collective shaping of discursive constructs that may lead to a particular agency in others. Learning can originate in experiences of engagement as an identity-building process that is socially situated and meaning driven. Learning research has begun to focus on identities as multiply constituted complexities that operate subjectively *between* identity (agency) building and emergent social practices.

Perhaps opening conversations of YSF participants can work to enrich our own thinking, our desires and resistances, in ways that help us find the agency within to change the storylines without. As Bakhtin (1999) states, stories contribute to people's natural proclivity to recycle strips of things said by others. Their power derives from their capacity to contribute to our own narratives as tacit co-authors of our own designated (or desired) identities. Because narratives authored by others are amongst our most important sources for learning, changing storylines may be the link to changing identities. Learning about our historically situated storied identities, formed in the moral stew of childhood, will remain a formidable challenge. Thus, the complex role of pedagogy in learning may be greater in (re)shaping identities/subjectivities than we have realized. The pearl of great price, the secret of learning as identity-forming, may lie in finding what counts as critical to one's identity rather than what counts as curriculum or as legitimate educational experience. Our opening task, it would seem, is to find links between individual learning and its distinct cultural-discursive traditions that bind (as resistances) or free (as desires) learning for EE/ESD.

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4. Sustainability – A Lost Cause or One Worth Educating For?

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Abstract: In this report, I have endeavoured to exemplify some of the many barriers, which exist to the teaching and learning of ES and to living sustainably. The examples given refer mainly to my experience in Inner-City Primary Schools in London, UK, but most would also be applicable to other countries, particularly those in the so-called 'western developed world'. There are many outside influences, which may make acceptance of sustainable living difficult for children, even if we were to be able to influence them through EfS in schools. These and the lack of influence wielded by the UN/UNESCO, plus the lack of commitment shown by most governments and school management structures, connive together to make the teaching and learning of ESD, in a way which will influence understanding, raising of awareness and commitment, very difficult. Thus it appears that there are far more factors working against transforming schools into 'models of sustainability' but nevertheless, the urgency of the situation, with the inevitable onslaught of climate change, means that we must act urgently to ensure that future generations benefit from what is already known. For the purposes of this paper, the terms Learning for Sustainability, Education for Sustainable Development (ESD) and Education for Sustainability (EfS) are interchangeable. I prefer the use of Education for Sustainability for reasons detailed below, but have used ESD when referring to the terminology of others.

Introduction - Sustainable Development or Sustainability?

From their inception, controversy and confusion have surrounded the concept and definition of, 'development for a sustainable future'; proclaimed originally as meeting the "needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987).

O'Riordan and Voisey's definition of the change to sustainable living quoted by Sterling (2001) is: "the process of coming to terms with sustainability in all its deeply rich, ecological, social, ethical and economic dimensions . . . It is about new ways of knowing, of being differently human in a threatened but cooperating world."(P13). He adds that we must speed the emergence of " the core values of sustainability such as sufficiency, efficiency, community, locality, health, democracy, equity, justice and diversity" (p.16).

Despite these and other 'codes' for sustainable living there remains a dichotomy between philosophy and practice. Huckle states, "Sadly there are only glimpses of this new morality in the contemporary politics of sustainability" (Huckle and Sterling 1996, p.11-12).

Confusion of interpretation, fuelled by a reluctance to accept necessary fundamental changes in lifestyle has lent credence to disparate views; from the purist -'living the sustainable development ideal' to the usurpation of the term to 'maintain the status quo'- valuing the rights of humanity above all other species and satisfying global, economic markets.

James Lovelock in *'The Revenge of Gaia'* (2006) considers that both approaches, ecologically sustainable development or 'business as usual' will unfortunately share the same outcome: "the probability of disastrous global change". He continues: "The error they share is the belief that further development is possible…. both measures deny the existence of the Earth's disease, the fever brought on by a plague of people" (p.3). Perhaps then, to aspire to 'sustainability or sustainable living', omitting reference to development and to focus on the right of future generations to sustainable life-styles would reduce confusion and discourage the expropriation of 'sustainable development' by those out to sustain profit and elitist life-styles?

It might also provide a focus for the world of education to reflect on and begin to harmonise the many incongruities between living and learning sustainably in our present mechanistic/reductionist society and educational system.

Background to EfS

EfS evolved from Environmental and Development Education. Enthusiastic practitioners have long inspired and motivated pupils through outdoor and contextual learning, using local, global, natural and 'human' environments. As threats to these environments have increased, this learning has become subsumed under the ESD umbrella.

From the UN Millennium Goals for Sustainable Development, the second Earth Summit in Johannesburg 2002, "reinforced ESD . . . to promote education as a decisive factor for change".

In December 2002, the United Nations declared the period starting 2005-2014 as the Decade of Education for Sustainable Development (DESD), stating that 'educated' nations leave the deepest ecological footprint and warning that "more basic education as it is currently taught will not create more sustainable societies . . . and that questioning, rethinking and revising education" is necessary for "creating a more sustainable future."

Yet within its current mandate, UNESCO can only '*invite and encourage* governments to '*consider'* the "inclusion . . . of measures to implement the Decade in their respective education systems and plans". 'Developed western' nations, however, remain ideologically distanced from sustainability, promoting burgeoning consumption and limitless economic growth as the primacy for 'development'; their educational institutions accordingly feeding young people into this flawed system; completely inhospitable to the principles of learning for sustainability.

UK Government Commitment to EfS

Since the 1970's, successive UK government departments have indulged in supportive rhetoric on environmental, development and sustainability education.

During the 1980s, however, measures such as the National Curriculum, SATs, OFSTED inspections and competition between schools, followed by literacy and numeracy strategies have seen primary education become increasingly reductionist, i.e. prescriptive, fragmented and subject/skills based. Since then, a plethora of reports, with aspects of sustainability implicit or explicit in their recommendations, have been published. Are they, however, a barrier in themselves, providing a 'smoke screen' of rhetoric, designed to belie true government inactivity and lack of commitment?

- 1998, a government Sustainable Education Development Panel drew guidelines for the teaching and learning of ESD, indicating that deep and innovative changes were needed. The report was not widely promoted in schools.
- 2003, OFSTED's 'Taking the First Step Forward – an acknowledgement of and guidance for good practice and self-evaluation in Education for Sustainability' - was published and trialled, but not included in routine inspections.
- 2003, DfES published the 'Excellence and Enjoyment' Strategy, designed to 'raise standards' by 'freeing' teachers to plan for 'more enjoyable' learning. Since most previous prescriptive elements were retained, however, real willingness to 'loosen the grip' on the curriculum was questionable.
- 2004, publication of 'Every Child Matters', coordinating the provision of universal support and aspects of holistic living for children - no explicit link was made with sustainability.
- 2005, DEFRA's sustainable development strategy for the UK, 'Securing the Future' was published. EfS warrants one page, mainly concerning extra-curricula activities and school buildings. It refers to the DfES' Five Year Strategy for Children and Learners (2004), which in one paragraph, contains a brief 'vision':

  "Every school should also be an environmentally sustainable school, with a good plan for school transport that encourages walking and cycling, an active and effective recycling policy… and a school garden or other opportunities for children to explore the natural world. Schools must teach our children by example as well as by instruction." *But how, when most educators are unaware of the example to be set?*

- 2006, DfES' 'Sustainable Schools' report is more encouraging, mentioning pupil empowerment, motivation through contextual learning and whole staff participation. *It nevertheless reveals ever-pervading weaknesses in the government's commitment*. Placing no emphasis on *whole* school/community democratic involvement in *real* changes in curriculum content and pedagogy (page 3) states merely that it '*would like*' every school to be a sustainable school' and that we need to 'make a decisive move *toward* sustainable development', with schools encouraged to achieve within the national framework by 2020, *thus conveying no sense of compulsion or urgency.*

Despite sustainable aspects of these reports, since government has failed to make connections or to clarify what constitutes '*sustainable education'* in its strongest form, in most schools, fearing so-called 'failure' (particularly those in inner-city areas where attaining enforced standards is particularly difficult) business continues as usual, retaining most imposed barriers to freedom and creativity and thus to the teaching and learning of EfS. Campbell (1982, p.328) thus warns: "educational reform may be seen as a "placebo", that is "symbolic gestures designed to indicate governmental [etc.] awareness of problems and sympathetic intentions, rather than serious efforts to achieve social change. That is, the rhetoric and activity linked to "educational reform" may function to legitimate those with political power rather than to change education" (In Ginsburg, M [1991] pp 3-24).

What other barriers exist?

As demonstrated above, one has to conclude that the overriding barrier is lack of long-term commitment and courage by the government to invest in the future of this and subsequent generations.

Dominated by the ethics and values of the market place and big business, nations competing for markets need workforces who are *'trained'* to fill niche industries, to earn, consume and thus complete the economic cycle. Sustainably aware citizens who are *educated* to think and question their place in the world, to contemplate human injustices and environmental degradation would, therefore, not be as useful to the competitive state.

Against this background, the myth has evolved that there once was a 'golden era' in education, when basic skills reigned supreme. In order to return to those 'halcyon days', pressure is put on local government and school managers to deliver a reductionist curriculum, an overload of targets and learning objectives, leading to competition between schools and individual teachers, performance related pay and loss of teacher autonomy.

The success of this deception, means that most 'users' of the system are now convinced that measured achievement in 'basics' is the all-important outcome of education. Managers and parents thus feel themselves empowered to pressure teachers to deliver these basics above 'soft options' such as issues of sustainability,

This is particularly, although not exclusively, true of inner-city/deprived areas where, with an air of elitism, already disadvantaged pupils are often denied wider experience and awareness. Basics dominate, in an attempt to 'raise attainment levels' towards those of their more affluent counterparts, increasing their use to industry/business.

Governments have elicited the cooperation of a new 'managerialist' breed of heads and deputies to enforce these restrictive policies. Mike Bottery (2000), reflecting on 'the assault on educational values' describes the new managerial system as 'cold' and the 'ethical core of leadership' as being reduced to an 'essentially technical rational function', senior managers being there not to provide educational and pastoral wisdom but to "direct and control these professionals and their practice to ensure that professional actions follow the dictates of external policy agendas"(p.61).

He continues that, "wherever managerial values achieve hegemony", the values of the organisation and of wider society are "cheapened and debased." Many would identify with that analysis of post-modern management. Schools where a democratic ethos, with shared policy making, good practice, care and collegiality, has been superseded by managerialism, 'taking the

heart out of the school' become difficult enough to work in, let alone to pursue the ethics and values of EfS there.

There are other practical barriers at LEA and school level e.g. those of staff mobility. With worsening working conditions, experienced teachers leaving and recruitment dropping, many schools, especially in inner city areas, are either forced to or by design, take on short-term staff, most of whom come from outside the community or abroad. Although, doubtless, perfectly fine teachers, they are often inexperienced and not committed either to the school community or to the future of education in this country. Many move on quickly, eager and ambitious to get maximum experience and therefore are also malleable and not wanting to upset management, have little reason to support radical initiatives, such as EfS.

The final obstacle is levels of personal knowledge, awareness and commitment among staff, the community and children. Where it may be relatively easy to motivate primary school children to recycle, grow organic vegetables, turn off lights or help make a wildlife pond, it is much more difficult to persuade them or particularly teenagers (and some staff/parents), to resist the consumerist culture thrust at them, to walk, cycle or take public transport instead of travelling by car/air or to appreciate the need to respect all other species of life, as well as all cultures and creeds of humanity.

Whole-staff training in EfS has been sadly lacking. Sustainability is not a simple issue of transferable procedures/practices, but one of attitudes, values and overall ethos. INSET sessions will necessarily be complex and controversial; space and time needed for discussion, airing concerns and doubts. Beliefs as well as teaching methods will be questioned and some staff will feel threatened and deskilled. *Government has made no provision for this kind of training*.

So is EfS a Lost Cause?

With the many existent barriers to EfS in British schools, it may seem a depressing and worthless exercise to attempt to further its implementation. However, there *are* drivers that can be used to further the 'EfS cause' and committed individuals and groups who are doing so.

In fact the UKGovernment Select Committee on Environmental Audit (2003), were "struck by how much has been achieved, despite the government policy vacuum, by a range of committed organisations and individual 'champions', acting on their own initiative."

There *is* also some commendable EfS work going on through a number of progressive local councils and schools. In Worcester, the head of an environmental centre found allies who transformed the ethos of their departments and employed staff to support environmental initiatives. They now have an ESD officer and nearly fifty per cent of their schools are registered for the 'Eco-schools' scheme. The 'Forest Schools' scheme also flourishes amongst other great environmental work at the Bishop's Wood centre there.

Eco-Schools provides an ideal focus for EfS, requiring a demonstration of commitment to whole school sustainability, in a democratic process led by an 'Eco-Committee', which give schools impetus and motivational support to aspire finally to 'the Green Flag.' Most schools, which participate, confirm that the Eco-Schools ethos, underpinned by a values code, drawn up by the children and the community, has a positive effect on learning, motivation and behaviour and go on to make curriculum changes to support and deliver EfS.

Canon Burrows C of E Primary School in Tameside, Greater Manchester, flourishes on this approach. The school is well supported and exudes friendliness and enthusiasm, reinforced by 'issues' posters and child-led behaviour codes around the school. The head teacher leads staff in an ethos of 'togetherness and enjoyment', apparent throughout the school. EfS and related projects pervade the curriculum and motivate children in their 'basic learning.'

The ESD coordinator leads the school in sustainability and grounds development issues, highlighting their importance and making involvement fun. Thus, with the passion and dedication of at least one member of staff and most importantly with vision and support from senior management, schools can affect attitudes and raise awareness.

A strong ethos, such as this, is the lynchpin of a sustainable school. In times of disagreement and uncertainty it will hold the community together protecting individuals from claims of indoctrination, politicisation and anti-capitalism. At times of change – high staff or management turn over - it will provide continuity.

This learning environment belies the government's feigned concern that teachers, weighed down by the multitude of recent initiatives, would resent radical EfS changes. In truth, most would be delighted to take on a more creative, 'liberated' way of working - having control over 'joined up teaching time', integrating subjects, and experiencing *real* learning outcomes. Teachers would be free to break from the current 'McDonalds/Teaching by Numbers' approach, where the habitual and the automaton reign supreme, leaving them no freedom or flexibility to respond to the future needs and aspirations of *all* their pupils**.**

With media and *some* government attention finally being given to climate change, there is now a growing acceptance that lifestyle changes are inevitable. Consequently some may begin to accept and perhaps *even* demand EfS in schools. Use of the climate change data and predictions from such as James Lovelock, originator of the Gaia Theory, can be used in arguments to drive forward EfS in schools. As well as providing scientific justification, Lovelock adds a spiritual dimension to the care of our planet and this can be used to evoke the feeling in children that they are part of a living earth, which is according to Lovelock "fighting back" because of our misuse.

In Conclusion - The Rights of Future Generations

Fundamental, is the *kind* of people we want to come from our education system and the world we want for the future. If we want people who will identify and solve problems, working cooperatively together, aware of the historical, geographical and cultural origins of problems and having a sense of tolerance, justice, rights and equity for all, then EfS is the way to go.

If we continue with present societal and educational priorities, we shall breed generations who, as now, are living increasingly for short-term gain and affluence, considering it their right 'to have' at the expense of others, with little empathy for the affect on others' lives.

Above all, it is the children who should be our greatest drivers in this debate. It is the enthusiasm of the children, such as those in Tameside and in inner London primary schools, with their cheerful commitment and feisty attitude, their identification of problems and solutions, speaking up for their beliefs and remaining undaunted by 'authority', that will carry at least some hope forward for the future. Children enthused by issues of sustainability in are persuasive ambassadors for change and are usually only too willing to make presentations to influential audiences.

Just as the government trumpets children's right to a good basic education, they must realise that they have even more right to the knowledge, skills, attitudes and values to deal with the environmental problems they inevitably face in the future. If we do not act urgently, then we have failed this, and future generations of children.

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5. The Ethical Dimension of ESD – Navigating Between the Pitfalls of Indoctrination and Relativism

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Abstract: This paper discusses how to deal with the ethical dimension of sustainable development in educational practice in the light of the democratic role of public education. Three selective traditions of environmental education in Swedish schools constitute the point of departure for this discussion: a fact-based tradition, a normative tradition and a pluralistic tradition. It is argued that the pluralistic tradition has many advantages, such as recognising the value dimension of sustainable development while at the same time striving to avoid the risks of indoctrination by highlighting different values and attitudes concerning the right and the good and also promoting students' critical thinking and action competence. Using a pragmatic perspective, it is stressed that a pluralistic approach does not necessarily have to be understood as relativistic. Rather than turning the issue of the foundations of our values into a theoretical discussion, a pragmatic perspective focuses on how values become established in different human practices. From this point of view, the diverse conditions involved in learning to communicate the right and the good in different situations are discussed. Similarly, how to enhance and facilitate the students' ability to participate in a democratic dialogue about a sustainable future is also aired.

Introduction

"The ethical dimension is central to understanding sustainable development, as emphasised in several international documents. Thus questions of justice refer both to equity between generations – as underlined in the most common definitions of sustainable development – equity within the present generation, as well as relationships between man and nature especially taking into account respect for biological diversity."[1] This quote highlights some of the most critical questions in sustainable development, such as whom we ought to take into account in our strivings for a sustainable future and to what extent; whether we are only responsible for sustainable development in our part of the world or throughout the whole world; whether everybody has equal rights to the same welfare; whether future generations will have the right to the same welfare as we have; how many generations we should be concerned about; whether future generations should have the right to experience wilderness and biological diversity; whether sustainable development concerns other species; whether animals and plants have the right to a secure future; etc. The main purpose of this paper is to discuss how to deal with such ethical dimensions of sustainable development in educational practice in the light of the democratic role of public education.

Different Traditions of Environmental Education

Traditionally, questions similar to those outlined above have had been included in environmental education (EE). It therefore seems reasonable to suggest that the progress of the practice of education for sustainable development (ESD) should build on and develop these valuable experiences of EE. In earlier studies (Öhman, 2004, see also Sandell, Öhman & Östman, 2005) I have suggested that the variety of ways of teaching about environmental and developmental issues can be viewed as different *selective traditions*.[2] The selective traditions represent different answers as to what constitutes good teaching in a subject, and includes different practices concerning the selection and organisation of the subject matter as well as the selection of forms and teaching methods. In the studies referred to, three different selective traditions within environmental education were identified in Swedish schools: a *fact-based* tradition, a *normative* tradition and a *pluralistic* tradition. The question is, to what extent are these different traditions appropriate both as a starting point for the progress of ESD, and for the creation of an approach to the ethical and moral aspects of sustainable development?

[1] Baltic 21E, p. 12

[2] The term 'selective tradition' was originally developed by Williams (1973) to underline that a certain approach towards knowledge and a certain educational praxis are always selected within the frame of a specific culture.

In the *fact-based* tradition, teachers primarily treat environmental issues as knowledge problems. This tradition is based on the idea that environmental problems can be dealt with by means of more research and information supplied to the public. The position taken is that only science can provide a reliable foundation for our knowledge about environmental issues and that scientific facts and models have sole importance in an educational context. The democratic role of education is to provide objective facts as a basis for the students' opinion-making. The democratic process is therefore something that comes *after* education. Objections that can be raised against the fact-based tradition as a basis for ESD are firstly that the value dimension of sustainable development is completely left out of education. Secondly, that the students do not get any experience of participation in the very act of democratic discussions or how to transform their standpoints into action, and thirdly, that the resulting action competence[3] is rather poor.

This leaves us with two remaining options: the normative tradition and the pluralistic tradition, both of which focus on the value dimension, but differ in the way they relate to the democratic process. In the *normative* tradition, the important task of education is seen as supporting a sustainable transformation of society. The answers to value-related issues are established through deliberative discussions among experts and politicians on the basis of scientific facts about the current state of the world, and are presented in policy documents and syllabuses. Schools are then obliged to teach students these environmentally friendly values and attitudes and, in this way, attempt to change the students' behaviour in a specific direction. The democratic process is therefore something that comes *before* education. The critique that can be raised against this tradition is that education runs the risk of being used as a political tool to create a specific predetermined society. This means that there is a danger that education will lose its emancipatory potential and its democratic obligation will be violated; the result being that education then resembles indoctrination (see the warnings of Wals & Jickling, 2000 and Jickling, 2003).

The *pluralistic* tradition is characterised by a striving to promote different perspectives, views and values when dealing with different questions and problems concerning the future of our world. One reason for this is that these issues have proved to be so complex that nobody can be certain that they have the right answers. Furthermore, although there is an agreement on certain facts, the judgments of these facts and our way of valuing the consequences of different measures may differ. From this it follows that environmental and developmental issues are often seen as involving conflicts between different interests. These conflicts can be both external between different groups in society, and internal between different values, desires and personal needs. The way to finding common answers to value-related issues, or recognising and accepting our different standpoints, is seen as being accomplished by deliberative discussion. Such discussions are an essential part of education in the pluralistic tradition, and the democratic process is accordingly situated *in* education itself. One could say that an aim of pluralistic education is to foster citizens who are competent at acting in a conscious way and participating in debates, discussions and decisions in these issues at a private everyday level as well as at a comprehensive societal level. This pluralistic approach thus seems to have many advantages as it takes the democratic role of public education into account and recognises the value dimension of sustainable development. At the same time, it strives to avoid the risks of indoctrination by promoting students' critical thinking and their competence to act. But here we encounter another problem: if one strives to illuminate different opinions about an ethical issue in educational practice, could this be interpreted as all alternative actions being equally right and all values equally good? In other words, might we be advancing what is generally known as *relativism*? And if everything is equally good and right, how might commitment to important issues be encouraged?

A Pragmatic Understanding of Pluralism

To a great extent, the answer to the question of whether pluralism implies relativism depends on the framework used to interpret such an approach. In a traditional analytical philosophical framework, the division between an inner mind and an outer world is a basic presumption. The

[3] See Jensen and Schnack (1997).

two options therefore appear to be either *objectivism* – that it is possible to anchor beliefs about the right and the good of the inner mind in an external foundation, or *relativism* – that no such foundations exist and that all opinions about the right and the good are merely personal or social constructions.

An alternative way of understanding pluralism is provided by the pragmatic philosophical tradition. Pragmatists like Rorty (1980, 1982/2003) have pointed to the difficulty of *theoretically* deciding whether our beliefs correspond to any eternal foundation or not. It seems, as Rorty puts it, that this would require access to an "unclouded mirror of nature", which means that we would have to have a "God's eye view" or, in other words, occupy a position outside language (see also Öhman, 2004 and 2006). Instead, pragmatists treat the right and the good as something that human beings establish in *practice* and in relation to certain purposes in their activities. In practice, it is a common observation that opinions vary between different human beings, and also that human beings change their opinions. It is, however, also the case that when we live through a specific situation, "one cannot find anybody who says that two incompatible opinions on an important topic are equally good" (Rorty, 1982/2003, p. 166). In practice, the question of whether a theory is philosophically grounded is generally not something we really give much thought to, although we *do* care about "the various concrete advantages and disadvantages it has" (Rorty, 1982/2003, p. 168). Thus, the question of relativism or objectivism is rarely a practical problem but a theoretical one that has its origin and meaning in the analytic philosophical tradition. In a pragmatic perspective, focus is rather put on the different human practices where human beings express and share their attitudes and opinions about the right and the good.

Communicating the Right and the Good

As indicated above, in terms of the value dimension of sustainable development it would seem possible to adopt a pluralistic approach without this necessarily having to be understood as advancing relativism. From a pragmatic perspective, the important teaching issue is not to find and teach the absolute right and good, but rather to develop the students' communicative competence to express and understand ethical and moral value judgments in order to increase their ability to participate in a democratic dialogue about a sustainable future.[4]

Socio-cultural studies of moral learning (see Buzzelli, 1996; Crawford, 2001; Tappan, 1997) have drawn attention to the fact that the learning of an ethical and moral language is rarely something we do in a systematic and conscious way. We rather learn to communicate opinions about the right and the good by participating in situations where other people express what they find to be fair, unfair, self-sacrificing, insulting, selfish, unselfish, greedy, generous, honest, dishonest, just, unjust, etc. In a pluralistic ESD, it therefore appears to be important to create opportunities for students to articulate their ethical and moral opinions and beliefs and thereby allow them to increase their sensitivity to the subtle nuances of language when it comes to communicating ethical and moral issues.

In both life in general and in school, we communicate the right and the good in many different ways in various kinds of situations where different conditions of learning prevail. So that students have a chance to develop their communicative ability to the full, it seems important that they encounter a variety of situations where value related issues are at stake. Considering and dealing with such situations in a way that avoids indoctrination, but that nevertheless creates possibilities for ethical and moral meaning-making and communication, is thus an essential component of a pluralistic ESD teaching-competence (for a more thorough illumination of these kinds of situations, see Öhman & Östman, forthcoming).

One kind of situation where our attitudes concerning the right and the good emerge is when we, without any previous considerations and reflections, *react morally*. For instance, this can happen when we see someone or something being treated badly, or when we spontaneously act in order to save someone or something that is in need (one can, for example, think of the way we might react if we saw someone kicking a puppy). One can say that in these situations

[4] For a discussion about a post-foundational EE and ESD see also Stables (2001).

we take spontaneous responsibility for another being. These reactions display human beings' *personal* moral commitments and the love and care they feel for others. In taking the democratic role of ESD into account, it appears to be important to make it possible for students to *express and share* their experiences of moral reactions, and that they learn to respect the moral emotions that people show in different situations, even though these emotions may not always be possible to explain or defend by rational argument. Ignoring students' moral reactions, or systematically try to inculcate a certain way of reacting would, on the other hand, expose ESD to the dangers of indoctrination.

A second way in which we experience opinions about the right and wrong way of acting is through social rules or *norms for correct behaviour*. One example concerns the norms connected with school biology excursions: not picking more plants than are necessary for the studies; putting the water bugs back into the pond after they have been examined; not harming shrubs and trees; not disturbing nesting birds, etc. It is often a requirement for activities and groups that different opinions about right and wrong are coordinated. A straightforward transference of norms can, however, be regarded as a form of indoctrination. From a democratic perspective it is therefore essential that the norms are discussed and the motives for the norm presented, and also that students are given an opportunity to critically reflect upon and influence those norms. It is also important to bear in mind that learning to act in accordance with a norm does not necessarily mean that one is personally affected. This learning can rather be seen as the acquiring of a social knowledge about how to behave in order to be an accepted member of a group. Another aspect of norms is that they are generally connected to a particular activity and community. It is therefore an open question as to whether norms learnt in school will influence the individual students' behaviour in their life outside its confines.

A third kind of situation in which values make an appearance in education is when we *ethically reflect* upon the good values and the right way to act. In these situations we often try to find systematic and rational arguments for how to handle certain moral issues. When we communicate and discuss such reflections, we are usually not in an immediate situation where we need to decide how to act. These ethical discussions therefore normally concern the *general ethical principles* that human beings *ought* to follow. In educational contexts, ethical reflections often appear as different forms of exercises, where the students are expected to take a stand on a particular ethical issue and explain and defend their standpoints. It is reasonable to assume that, in this way, students experience different forms of ethical reasoning and learn to relate critically both to their own behaviour and to the norms they experience in school activities and in society in general. A recurrent integration of ethical reflections in educational practice can accordingly be seen to be in line with a pluralistic approach in ESD. It is, however, important to keep in mind that, in real life, moral dilemmas seldom appear as an intellectual process where we choose between ethical principles. The choices involved are rather about the actual consequences of different ways of acting, for others as well as ourselves. A knowledge of ethical principles is therefore not always of help when it comes to important moral issues in real life.

Conclusions

In this paper I have suggested a way of treating the value dimension of ESD that is based on a pluralistic tradition of environmental education. Instead of promoting a preconceived idea of what constitutes a sustainable society, a pluralistic approach implies that sustainable development is a subject for constant discussion, where ideas pertaining to sustainability are continuously reconsidered. In this way, sustainable development appears as a direction rather than a fixed goal.

In a pluralistic ESD, students develop their democratic action competence by participating in democratic discussions where they critically evaluate different alternatives, formulate valid arguments for their standpoints, consider other people's arguments, learn more about their own and others' emotional reactions, etc. This way of communicative learning is not accompanied by the learning of a specific attitude to what is good and right, but merely means that students learn a common way of understanding different expressions of the good and the

right. It is thus an education *in* democracy, where students are already regarded as democratic citizens, rather than an education *about* democracy that prepares them for future democratic actions and discussions.

Such an educational practice can only be considered as relativistic if one believes that it is possible to find foundations for our ethical principles and moral attitudes outside human practice. If not, a pluralistic educational approach is rather a way of making school one of the arenas where value judgments concerning our common future can be displayed, deliberated, exchanged and agreed on in open democratic discussions.

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6. Action Learning: A Tool for Promoting Values and Ethics in Education for Sustainable Development

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Abstract: My main focus is to demonstrate Action learning as a means of improving the quality of education by contextualising values and ethics in ESD. Values related to environmental protection and management, local knowledge, skills development, sustainable entrepreneurship and livelihood and poverty are issues of concern in my paper, in making learning relevant to the needs of the learners.

This paper attempts to demonstrate, how Action learning is an effective tool for instilling values and ethics in learners, and through research findings and practical experiences from the Eco-Schools programme in Kenya, that Environmental Action learning is a strategy for improving the quality of education, i.e. promoting interdisciplinary, holistic, value-driven, critical thinking, problem solving, use of different and participatory pedagogies and relevant content.

UNESCOs International Implementation Scheme for Education for Sustainable Development (ESD) 2004-2014 recognizes that Education for Sustainable Development carries with it the inherent idea of implementing programs that are locally relevant and culturally appropriate taking into consideration the local environmental, economic, and societal conditions. The working paper for ESD in Africa also emphasizes contextualization of ESD with regard to environmental protection and management; education systems and trends; knowledge systems, including indigenous knowledge; skills development, sustainable entrepreneurship and livelihood; cross-cutting themes such as human rights, gender, equity, literacy and partnership; cultural beliefs, values and practices and poverty (UNESCO 2005). The Millennium Development goals emerge as the backbone of development in Africa therefore implying that learning should be reoriented to be life-long and equip learners with skills to lead sustainable livelihoods.

Despite the above needs and values for Africa the Status of ESD in Africa study report indicated that Africa faces several challenges/barriers with regard to implementation of ESD. These include: Heavy workload on implementers in the current education systems; Poor integration of indigenous knowledge; Inadequate involvement of the local community; Inadequate Action learning and research; Inadequate time for in-service training for teachers; Lack of competent human resources and training facilities; Gender disparity and negative teacher attitudes; Bureaucracy and difficulty in placing sustainability issues in the different disciplines of the education systems and the complexity of the ESD concept (UNESCO 2005).

Effective handling of societal values needs and ethics in ESD requires enabling policy measures and curriculum frameworks such as teacher training, improved resources, action research, inter-and trans-disciplinary learning and action learning. Using a case study of Kenya, this paper will demonstrate how values and ethics should be handled through Action Learning. Action learning applies experiential learning to values education. Most action learning activities are community based and real-life experiences. These include outdoor learning, cross-cultural exchanges, internships and community service programmes (UNESCO-UNEP 1985 p. 26).

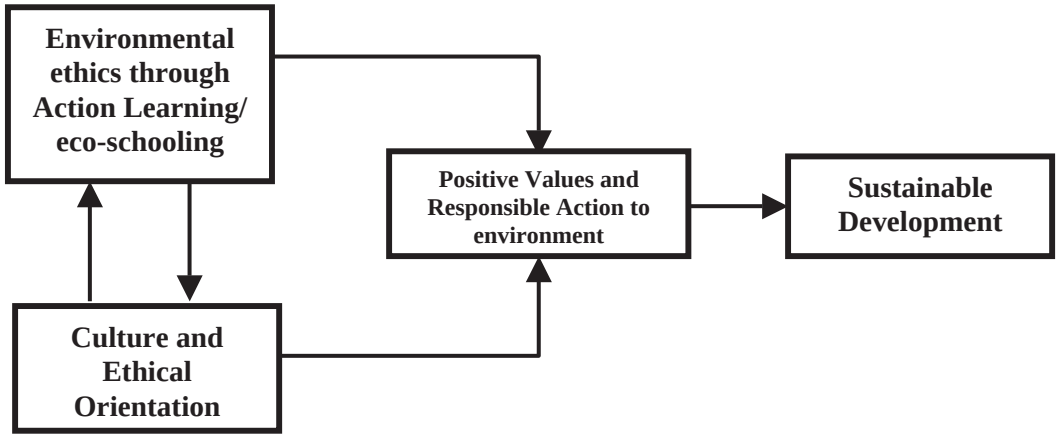
Otieno's study on the importance of a Dynamic School Curriculum in the promotion of Environmental Ethics in Kenya Schools, 2002, helps to understand the process involved in Action Learning. Environmental Ethics in this study refer to certain instructions (directions, permissions, or prohibitions) about how we may or should treat the environment. Holistic ethics, which gives consideration to all forms of nature was of main concern. Other approaches to environmental ethics, which were analysed are Utilitarian, Pathocentric, Natural Law, Biospheric, Reverence for life, Religious, African, Ecofeminist and Pragmatic ethics. Environmental Ethics clarify values at stake in policy decisions and give moral reasons for alternative courses of action as well as help to resolve some of the outstanding value conflicts that thwart conservation and development projects (Engel, R.J. 1993:7).

The main objective was to examine environmental ethics in the school curriculum and environmental management practices of the learners. Amongst other objectives the study sought to: identify components of cultural environmental models and values that can be integrated in the school curriculum which address Kenyan needs; determine whether the teaching/learning resources are adequate and appropriate for EEE; ascertain the constraints to the implementation of environmental ethics in the school curriculum and possible solutions.

Using the fundamental elements of the eco-school model, the study evaluated the potential of Environmental Action Learning (EAL) as a strategy for instilling values in the learners. This resulted into the formulation of the eco-school concept for Africa. Given the Viability of EAL/Eco-schooling it was necessary to pilot the eco-school model to establish the possibility of using it as a means of ensuring the transferability of holistic environmental ethics and values into responsible action for sustainable development. The pilot phase tested the workability of the EAL/ eco-school framework. i.e. school environmental policies; localizing curriculum and learning materials, micro-projects; school-community partnerships; networking.

The theoretical, framework of the study contended that there is a link between culture, environmental ethics education, values and sustainable environmental development. Principles of environmental ethics are derived from a people's culture and inculcated in the learners through action-oriented learning/eco-schooling. The outcome should be positive values, responsible behavior towards the environment and consequently, sustainable environmental development. Figure 1 below summarizes this linkage:

Figure 1: Linkage between Ethics and the Environment

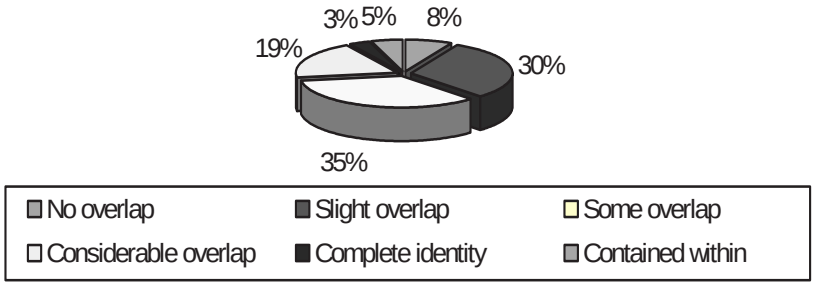


Source: Dorcas Otieno Research Designer

The research employed a survey and participatory methods of data collection. The sample of the survey included 720 respondents (240 students and 480 teachers) randomly selected from primary and secondary schools from three districts of Kenya namely Kakamega, Kajiado and Nairobi. Content analysis, interview and observation schedules, students' attitude tests and essays were used to enhance data.

The study revealed several environment development conflicts, which clearly show the need for Environmental Ethics Education (EEE) to produce citizens who would make value judgment regarding environmental issues in Kenya. Despite this content analysis revealed that both primary and secondary textbooks were permeated with utilitarian ethics, which was responsible for the destruction of the environment. Most of the environmental ethics were presented as facts and not dilemmas and so they did not stimulate logical and moral reasoning in the learners. Despite the fact that models of EEE should be complete identity or contained within, most teachers reported some overlap (34.5%) and slight overlap 30.3%. between their subjects and environmental ethics. This was inadequate to influence leaners' attitudes and behavior.

Figure 2: Teachers perspective of Environmental ethics in the school subjects



Students' high degree for consideration, love and sympathy for nature and holistic reasoning for unacceptability for environmental degradation reflected in the attitude test was absent in their essays which instead portrayed mostly utilitarian ethics. Inadequate resources, community opposition, student un receptiveness and large class size, interdisciplinary nature of Environmental ethics Education, lack of training and in-service, examination oriented curriculum were factors that hindered effective incorporation of EEE in the syllabus. Consequently, the study found that the school curriculum did not achieve the expected outcomes of EEE.

Most of the teachers used lecture method as opposed to more interactive ones like audio-visuals, laboratory, case studies, simulation games, community projects and role-playing exercises. In addition, moral development, value clarification, inculcation and action learning strategies were not fully utilized. Dormancy of environmental clubs in the schools, overloaded curriculum, lack of time and resources were found to affect environmental learning.

The hidden environmental ethics education curriculum management of school grounds needs to be emphasized because it initiates supports and extends the formal curriculum and develops, learner's environmental management skills for solving real life problems. It is important that once ethics has been incorporated in the various disciplines the school reinforces what it teaches. Effective transmission of environmental values into the learners requires that content is selected, adapted and modified for the learner. Environmental action learning, which entails auditing, sharing information, reporting ideas and taking action on the environment, should therefore be central to Environmental ethics Education. Based on the expected outcomes and competences of EEE, regular evaluation needs to be carried out.

Teachers' self-assessment generally revealed their lack of solid grounding in the knowledge and skills necessary to effectively handle environmental ethics education as indicated in table below.

Table 1: Teacher training needs for environmental ethics

Areas of Environmental ethics	Solid	Average	Weak	N
Basic Theories & Foundations of Ethics	50 (21.0%)	66 (27.7%)	122 (51.3%)	238 (100%)
Development of Environmental ethics	52 (21.7%)	66 (27.5%)	122 (50.9%)	240 (100%)
Methods of teaching Environmental ethics and Evaluation	52 (21.7%)	78 (32.5%)	110 (45.8%)	240 (100%)
Communication skills	66 (27.5%)	68 (28.3%)	106 (44.2%)	240 (100%)
Ethics policies	46 (19.2%)	56 (23.3%)	138 (57.5%)	240 (100%)

Viability of Environmental Action Learning

Findings of the case study of the potential of EAL in schools in Nairobi revealed that there is need to improve environmental ethics education in schools by designing a clear policy on EAL, the integration of EAL in the curriculum; mounting an intensive teacher-training and public awareness programme; networking; availing resources and facilities for EAL including professional services from Environmental Education Centres.

In addition, the following lessons were learnt upon evaluation of the projects:

Environmental dimensions and perceptions: School communities are made of differing eco-systems that members interact with in their daily lives. Physical, social, economic and political dimensions that influence practices and activities characterize this. Problems, risks and conflicts that arise from these interactions necessitate environmental processes of action learning that will enable learners to explore strategies of sustainable living.

Learning processes: Cultural orientation and values can be refined or even be altered through lifelong learning experiences and encounters. Environmental learning therefore needs to be value based and problem solving through taking prompt action upon acquiring new information and skills. Learners learn more effectively when they are confronted by an environmental problem that they have to investigate about, find a solution and take action to improve the situation. This process is characterized by information seeking and enquiring, reporting ideas and taking action all which contribute to developing insights and competence s for making informed decisions and choices for better environmental management.

Resolving and clarifying environmental concerns: Action learning enhances conflict resolution since the learners are able to mobilize database of valuable information as they continue to seek more information through new encounters. Building from what is known to the unknown enhances choosing of sustainable alternatives.

Curriculum work: Environmental problem solving being the focus of action learning is integral to all subject disciplines each of which contributes to the development of specific skills and competences as follows: Social sciences develop skills of environmental citizenship and risk management and life adaptation; Language and communication disciplines enhance the art of investigation, articulation, communication and comprehension of environmental messages; Natural science subjects equip learners with techniques of investigating, provide information and understanding of life support systems, risks and conflicts involved in the use of natural resources; Arts and cultural based learning areas develop creative problem solving approaches; Technical subjects help to develop learners' skills in design and development choices, impact assessments and remedies; Mathematics works as a tool for calculating, assessing and communicating environmental impacts and risks; Commerce and economics disciplines enable the learners to identify economic development activities that are sustainable and environmentally friendly; Life orientation subjects assist the learners in realizing environmental risks as well as their responsibilities in choosing sustainable lifestyles.

The schools based micro-projects established in the 12 pilot schools have effectively addressed poverty alleviation in the communities through income generation activities. The local community and in particular students have been the beneficiaries receiving e.g. improved lunch programme and free seedlings but most important gained skills and competence which enabled students and community members to practice and change practice. Lessons learnt from the Environmental Action Learning/Eco-schools programme in Kenya are realized in form of benefits

- The school Environmental policies and action plans provide a framework for learning about the Key issues of the environment, developing positive attitudes and commitment to the environment, active participation in resolving environmental problems, greening and managing the schools resources and setting examples of best environmental practices.
- Through localized curricula, the opportunity for addressing local environmental issues across subjects through field studies and the use of school grounds is provided.

- The dynamic curriculum enhances advocacy and vision building the integration of environmental values and concerns
- Micro-projects set up within an Eco-school programme give students firsthand experiences on basic scientific skills like observation, experimentation, recording facts, analyzing records and drawing conclusions and inferences.
- School-community partnerships are established that can enhance the sharing of resources, knowledge, and skills.
- Local and international networks developed through an Eco-school programme can provide access to support agencies. Through these networks, opportunities for local and National information sharing including Use of Information Communication Technologies are created.
- Monitoring and evaluating outcomes of micro projects and other learning activities to assess impacts of problem solving initiatives in schools and the community makes learning a lifelong process.
- With its participatory approach, involving learners themselves in both activities and decision-making processes, EAL/Eco-schools can be an important instrument for promoting the values of participation and citizenship.

Other Benefits include: Prestigious Eco-school awards given to participating schools; Savings in consumption and conservation of resources through best practices as per the environmental audit and school policy; Generation of income from Micro-projects; Reduction in pollution through best practices as per the school Environmental policy/Eco-code.

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7. How Might We Enhance the Role of Research in the Development of Education for Sustainable Development?

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Abstract: That research should have a role in the development of Education for Sustainable Development (ESD) is clearly recognised by UNESCO in its International Implementation Scheme for the Decade of ESD. UNESCO's view is that: *By applying what we already know from educational research and best practices to inform ESD, the educational community can make rapid progress in the initial stages of the Decade and ensure greater quality. […] DESD efforts need to be informed by research and development* (UNESCO, 2005, p. 13). Taking this idea of 'applying what we know from educational research' as a focus, this paper asks how much we know about the process of research utilisation within ESD and what we might learn from developments beyond the ESD field. The paper uses ideas and examples from wider literature about education practitioners' use of research to explore how we might improve the *accessibility* of ESD research, the *mediation* of ESD research and the *use* of ESD research. The underlying aim is to raise strategic questions about the relationships between research, practice and policy in ESD.

How much do we know about the use and usefulness of research in ESD?

In terms of understanding the ways in which research is perceived and used by practitioners and policy-makers, it would seem that the field of ESD varies little from that of education generally. Both suffer from a distinct lack of empirical investigation into the use and usefulness of research from the perspective of the research user. The following two quotes, both pertaining to education research generally, could equally easily apply to work in ESD and environmental education (EE):

> *While there are very many normative perspectives on what the relationship of research and practice* should *be, there is surprisingly little data about what it actually* is *(St. Clair, 2004, p.1). [original emphases]*

> *Only a few studies cast light on the ways in which teachers understand and use research in their practice (John and Prior, 2003, p. 232)*

Fortunately, this is a situation that is beginning to change, as the research-practice/policy interface becomes a legitimate focus for empirical enquiry and conceptual discussion. In particular, studies of practitioners' and policy-makers' sources of research information (e.g., Everton *et al.*, 2002), perceptions of research outputs (e.g., Ratcliffe *et al.*, 2004) and ways of engaging with and using research (e.g., St. Clair *et al.*, 2003) have increased in number over recent years. Allied with this there has been a growth of conceptual writing about research utilisation (e.g., Nutley *et al.*, 2002), research impact/dissemination (e.g., NERF, 2000) and strategies for supporting research use (e.g., Walter *et al.*, 2003). While very little of this empirical and conceptual work has been carried out in the context of EE or ESD, I would suggest that there is much to be learnt from this wider literature. More specifically, I want to argue that there are important implications for the ways in which we might think about enhancing the accessibility, mediation and use of research in ESD.

How might we improve the *accessibility* of ESD research?

While little is known about whether and how practitioners/policy-makers access ESD research, work on educational research more generally provides some interesting insights into the usefulness of different (i) sources of research information and (ii) types of research output (see Table 1).

Table 1: Insights into Sources of Research Information and Research Outputs (Based on literature reviewed in Rickinson, 2005)

Sources of Research Information	Types of Research Outputs
A wide range of information sources are important e.g., INSET, accredited courses, conferences, online resources, colleagues, books, newspapers, journals.	Traditional research outputs are often problematic for practitioners due to: the inaccessibility of the language; and the challenge of locating work that is relevant.
More useful sources tend to be: • Indirect e.g., research-based teaching materials • Informal e.g., conversations with colleagues • Interactive e.g., CPD workshops • Easily accessible e.g., the Internet.	More useful outputs: • Come in a format that is tangible and useful with clear implications for practice • Focus on real practical situations and provide case study portraits of strategies • Use crisp, plain language, colour and visual illustrations • Are based on convincing findings.

While the detail that lies behind Table 1 is beyond the scope of this paper, there is an important general message about the importance of understanding the information needs and communication preferences of different kinds of research users. An example of this from the UK is a website that provides research-based information for busy professionals in schools (Box 1).

Box 1: Research of the Month for Teachers
http://www.gtce.org.uk/PolicyAndResearch/research/ROMtopics/

In 2001 the General Teaching Council of England launched an online research resource for teachers called *Research of the Month*. The site provides a monthly research summary on a topic selected to be of interest to teachers. The site has a number of features that exemplify the way in which it has sought to support practitioners' access to research. For example:

- The summaries include illustrative school case studies alongside details of the research
- The summaries are all structured around clear and engaging questions
- Clear signposting allows readers to quickly go to parts that are of interest to them
- An explicit appraisal framework is used to identify studies that are both relevant and rigorous
- Full summaries can be downloaded by readers who prefer a hard copy
- A feedback facility and discussion forum allows readers to respond and share ideas.

What is significant about this development is the way in which it has been informed by careful thinking about the nature and purpose of research dissemination and utilisation. To quote from an article by Saunders (2001) about its development:
We are trying to exemplify a 'pedagogical' model of research dissemination. Research of the Month is emphatically not about tips for teachers, but is intended it support critical and sustained investigation of practice. Essentially, we want Research of the Month to stimulate an informed demand for research, in which there is a shift from 'transmission' – researchers disseminating their outputs – to 'transformation' – professional seeking and sharing knowledge and understanding from research-informed practice (p. 5).

But how might this example and the general points in Table 1 help to inform future efforts relating to the accessibility of research in ESD? I would suggest the following three ideas as starting points:

- ESD as a field has the potential to think much more carefully and creatively about the nature of research information and how such information is communicated
- Work in this area needs to be informed by in-depth understandings of who the research users are in ESD, what their interests are, how they like to access information, and so on

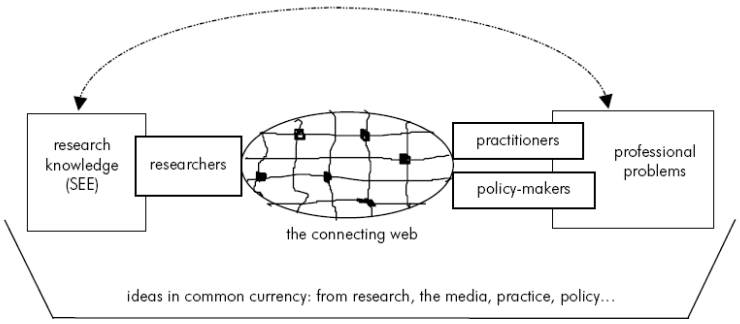
- Improving the accessibility ('transmission') of research is not enough in and of itself; it has to be matched by efforts to support mediation and utilisation ('transformation').

How might we enhance the *mediation* of ESD research?

An Australian study that sought to explore the effects of research on policy and practice by backtracking from educators' practices put forward a 'user-centric' model of the impact of educational research (Figure 1) (Figgis *et al.*, 2000). Instead of a simple linear relationship between research and practice, they found evidence of 'a connecting web […of …] linking activities [such as] conferences, taskforces, reports, media coverage and Internet sites' (DETYA, 2001, p. 3). This is supported by several other studies of research impact that have shown:

- The significant role played by mediators such as professional associations, think tanks, teacher unions, CPD providers and local education authorities (Ratcliffe et al., 2004)
- The importance of professional learning networks and practitioner dissemination and research networks (CUREE, 2003)
- The value of 'sustained interactivity' between and among researchers and practitioners as part of the research process (Huberman, 2002, p. 263).

Figure 1: A User-centric Model of the Impact of Educational Research (Figgis et al.*, 2000)*



The important point here is that the relationship between educational research and educational practice/policy is complex and mediated rather than direct and linear. This suggests that enhancing the role of research in the development of ESD will need to involve understanding and strengthening the field's 'connecting web'. Questions such as 'Who or what are the main mediators of research in ESD?' and 'How can their activities be supported and strengthened?' are critical if UNESCO and its partners are serious about 'applying what we already know from educational research and best practices to inform ESD' (UNESCO, 2005, p. 13).

How might we support the *use* of ESD research?

If questions of access and mediation are important, then issues of utilisation are critical. It has been all too easy for researchers to focus on disseminating information rather than supporting its utilisation. The difference is crucial and is underpinned by the idea that research use is about learning and so needs to be seen 'as a pedagogic problem' rather than as a transmission problem (Bell *et al.*, 2002). As described earlier, it is only relatively recently that studies in education have looked into the ways in which practitioners and policy-makers engage with and use research. The small amount of work that has been carried out, though, provides useful insights into the nature and context of research use amongst practitioners.

One key point is that research utilisation by practitioners is complex and multi-faceted both in terms of process and purpose (Table 2). Practitioners seem to use research in ways that are active, selective and variable, as well as values-rich and rewarding. Furthermore, the process can be about validating practice, challenging practice, prompting reflection about practice, stimulating research about practice or improving/changing practice.

Table 2: Insights into Research Use by Practitioners
(Based on literature reviewed in Rickinson, 2005)

How do practitioners use research? (processes)	What do practitioners use research for? (Purposes)
• Active e.g., more akin to 'translation' • Selective e.g., idiosyncratic and individual • Values-rich e.g., 'must resonate with prior beliefs' • Rewarding e.g., 'educative and enlightening' • Developing e.g., more sophisticated with time	• To support/justify – research providing affirmation or ammunition • To challenge – research raising difficult questions • To reflect – research stimulating reflection • To investigate – using research by doing research • To change – research stimulating a change of direction • To inform – research providing ideas for future practice

A second important idea concerns the contextualised nature of research use and the need for organisational cultures that value and support research engagement. The conclusion of a review of the pre-2001 research utilisation literature was that:

> *the main barriers to knowledge use in the public sector are not at the level of individual resistance but originated in an institutional culture that does not foster learning (Hemsley-Brown & Sharp, 2003, p. 460).*

Similarly, a recent systematic review of the effectiveness of different mechanisms for promoting research use across the health, social care, criminal justice and education sectors found that:

> *research use is enhanced by interactions between researchers and research users, and by providing a supportive context for the uptake of research or research-based practice. Strategies using multiple mechanisms to encourage research use are also often successful (Walter* et al.*, 2005, p. 335).*

All of this suggests that enhancing the role of research in the development of ESD will require not only creative research outputs and well-informed mediators, but also genuine support for cultures of research engagement. Such cultures need to be based on an appreciation of research use as a process of professional learning rather than 'merely bringing new information about what works to bear on professional practice' (Cordingley, 2004, p. 80).

Why is any of this important for ESD?

Recognition for the centrality of learning within debates about sustainability is growing. Scott and Gough (2003) are clear that 'there will be no sustainable development where there is no learning', while Sterling's ideas about *Sustainable Education* work from the basis that 'the difference between a sustainable or a chaotic future is learning' (2001, p. 10).

The purpose of this paper is to argue that one important dimension of the learning associated with Education for Sustainable Development will be engagement in and with research. In this respect, there is much to be learnt from developments relating to research impact, knowledge transformation, evidence-informed practice and research use happening well beyond the field of ESD.

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8. A Perspective on Risk, Policy, Community-Based Early Childhood Development and Education for Sustainable Development in South Africa

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Abstract: This paper looks at environmental risk and its effect on the early childhood sector (0-9 years) through the example of the Raglan Road Community-Based Early Childhood Development Centre. More specifically, it looks at the interaction between context, policy and teaching and learning processes in response to contextual and global risk in a community-based context in South Africa, with data specifically drawn from a study done at the Raglan Road Centre. In a sector that is under-resourced and with a very small political voice, there is often very little formal engagement with environmental issues; however, the sector is filled with contextual examples of teachers and learners learning about and responding to these risks at local and community levels. This paper explores how this sector responds to environmental risk both formally and informally, and through local and national policy. Through this exploration, the paper attempts to highlight the drivers and barriers that exist and their relationship to education for sustainable development.

Risk[1], sustainable development and international policy

In providing a broad policy vision for Early Childhood Development (ECD), the Department of Education's *Interim Policy on Early Childhood Development* (1996) emphasised the multi-pronged and integrated nature of ECD strategies that included a range of partnerships; the Raglan Road Community Centre is currently functioning within such a framework. This partnership framework was even apparent in the structuring of teaching and learning processes, seen in the example of a teacher inviting a community volunteer to assist with teaching learners about HIV/AIDS as she felt the volunteer's skills would complement and extend her own.

One of the tensions that was evident in the national audit of service provision for the ECD sector (DoE, 2001) was that between a community-based, multi-age-group model of inter-sectorial provision with an emphasis on the development of safety nets for children and families on the one hand (usually 3-6 years-old, with extended services for 0-3 years-old), and the school-based model that focused on formal education (the provision of one Reception year for 6-year-olds) on the other (Porteus, 2004). Community-based centres inevitably serve children who are faced with a number of developmental challenges and issues, and living in poor socio-economic conditions with under-trained or untrained teachers. Children and adults in these communities are often faced with an array of risks, both external and material, arising from socio-economic issues. For example, teachers at Raglan Road noted that children in their community faced risks resulting from the following issues: malnutrition, lack of health care leading to poor health, a lack of services resulting in a poor quality of life, material poverty (which was directly related to large unemployment figures in the area) neglect, abuse, HIV and AIDS, poor community and home environments and a lack of access to education; they further noted that many of these risks arose or were made increasingly worse by a lack of capacity and capability on the part of adults in the community. In the case of the Raglan

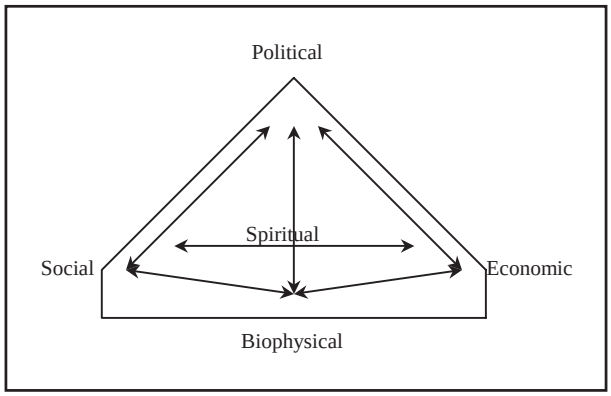

Fig. 1. A diagram depicting the inter-relationships between environmental dimensions in the community-based ECD context (adapted from O'Donoghue, 1993)

1 Risk a potential 'danger' that may occur in the future. The concept of 'risk' involves a degree of uncertainty and prediction, often based on mathematical possibilities (Beck 1992). For example, there is a risk high levels of pollutants will result in global warming; with global warming, there is the risk of changing weather patterns across the globe, potentially resulting in a loss of biodiversity.

Road Community Centre, there is an integrated approach to developing both child and parent capability in a number of integrated strategies that extend beyond formal education and address both the children's and the community's needs more holistically and immediately than a school-based approach would allow.

School-based approaches respond to a narrower spectrum of risks and to a narrower population (children attending the school). Responses are also limited in that they are restricted to issues covered in the school curriculum and to the scope of formal schooling. Many of the approaches to risk reduction, however, need to include broad-based, long-term strategies, and should ideally involve the development of empowered individuals who can think critically and act reflexively (Beck, 1992), indicating that school-based approaches may not adequately respond to environmental risk in a South African context.

Community-based initiatives on the other hand, are in a position to address a wider spectrum of needs and respond to a larger number of both external and material risks; they are however, also vulnerable to a larger number of risks than school-based centres, including those associated with funding, teacher training, resources, facilities and state structural support. Programmes and educational initiatives are not limited to children attending the school, and centres can potentially provide a large amount of support for issues arising within the private lives of learners and within the broader community. This is illustrated by the programme organisers chosen at the Raglan Road Community Centre. For example, issues of HIV/AIDS, child abuse, nutrition and hygiene are all associated with the private lives of learners, and through the creation and support of community and family safety nets teachers are able to access learners' private lives where they are able to influence their lives through intervention, community work-shopping and adult education. Community-based centres are in a position to work with community development, from early childhood development through to adult training and education in integrated ways that build family and community support structures as they progress. For example, the Raglan Road Community Centre functions within the following model:

- The ECD centre forms the core of the community centre.
- The school takes a whole-child approach to education, which in effect deals with the cognitive, physical, emotional and social development of learners. This also includes active monitoring of issues of child abuse and neglect, and anti-abuse and neglect measures built into school policy and school functioning. In addition, a nutrition programme at the school ensures that learners receive sufficient nutrition to support their development, and the school day is structured to allow children to make use of this support.
- The centre runs 10 community projects and programmes aimed at developing capacity in adults as a response to risks that indirectly and directly affect children and adults in the community (for example, literacy and numeracy courses that are aimed at improving adult capacities for employment in addition to enabling parents to assist their children with school work, which in turn supports the children's development and increases their ability to stay and be successful in school, which in turn improves their potential to find employment and deal with other risks and issues in later life.
- In addition to capacity and capability development in community members, the centre facilitates the running of community workshops and self help programmes that deal with issues such as HIV and AIDS, abuse and neglect; issues that potentially place learners in risk positions. These programmes are supported by the 10 community projects, for example, a workshop on HIV and AIDS is supported by nutritional and herbal projects that provide low-income solutions to issues associated with this disease, such as poor nutrition or a lack of available medication. In addition, the ECD centre works with learners to develop capacities for dealing with this disease emotionally, physically and intellectually through the explicit school curriculum. Teachers also monitor learners for signs of sexual abuse that affect learners in areas with high HIV/ AIDS rates (part of the school's implicit curriculum).

As can be seen above, the community-based programme is embedded within a contextual framework for education and development, resulting in the restructuring of private-public life

boundaries in direct response to contextual issues and contemporary risks. This appears to directly influence teaching and learning processes at the school, for example, one of the teachers at Raglan Road noted that "sometimes at home there are older people who rape young children, so I want them to be aware of those strangers … this lesson is very important to them – even to their parents … they use that information even at home" (Nolongo-Siwa, pers. comm. 2004), and another teacher noted that "I want the children to be familiar with things that are happening in hospital because … they are scared … so I want them to go and make research with their parents about what is happening … so that they can be able to identify the problems that are happening at home" (Thambo, B, pers. comm. 2004), indicating their intentions to impact on and influence the private lives of learners.

As a response to risk, a community-based ECD approach would therefore seem to allow for a more integrated approach to a wider spectrum of external and material risk, which in turn serves a larger population of South Africans in a larger number of ways at a local level, not the least of which is the development of capabilities (see Sen, 2001). This response appears to manifest in different ways within the school: policy development; programme structuring; participation in programmes (including both children and adults); and in the explicit curriculum offered to learners.

Thus, this approach to ECD provision appears to provide a tangible way of implementing the social goals of the formal curriculum (as outlined in the RNCS) – particularly the principles that relate to social justice, inclusivity, human rights and a healthy environment; this in turn, is directly linked to the Bill of Rights in the Constitution of South Africa. This paper thus illustrates a practical approach to engaging these broad-based policy frameworks meaningfully at a local level in the ECD sector. It also provides a practical case example of some of the policy proposals put forward by UNESCO (2002), in their articulation of Education for Sustainable Development.

Evidence of these relationships can further be evidenced at a school and national policy level, as discussed below.

School policy and context

A close relationship can be seen between context and policy in Early Childhood Development (ECD) Centres in South Africa (see for example Vallabh, 2004). For example, at the Raglan Road ECD Centre, the local context and contextual issues have a direct effect on the school policy, both explicitly and implicitly, especially with regard to socio-economic issues affecting children (for instance, issues of child abuse are both explicitly and implicitly embedded within the school policy by vocalising the school's intention to reduce abuse in the school policy objectives and by providing structures to reduce abuse in the rules section of the policy) *(ibid).* In addition, there is evidence that the school policy also reflects the broader South African context with regard to dominant ideologies currently shaping South African society, for example, issues of inclusivity, transformation, partnership are equality featured. A further contextual factor reflected in the school policy is aimed at provision against future contextual issues, both at local and national levels, through for example, building leaders that have the potential to contribute to the country on a national level, as well as at a personal level where children are enabled to stay in school, which in turn provides greater opportunity for skilled employment after their schooling is completed. The policy clearly demonstrates the rights-based approach to both education and development adopted by the centre, further reflecting a resonance with national policy, and international policy on Education for Sustainable Development (ESD[2]).

In this case, school policy is used to verbalise an integrated approach to education and development in response to a number of key socio-economic issues in the local context, namely,

[2] It is useful to note that in a Southern African context, the terms Environmental Education (EE) and Education for Sustainable Development (ESD) are inter-changeable. Both refer education about the inter-relationships between various environmental dimensions, including (but not limited to) political, biophysical, economic and social dimensions, and action in response to issues and risks arising from these inter-relationships. Although the term EE is much more commonly used in Southern Africa, for the purposes of this paper, ESD is used as a more common international term to describe this relationship.

child abuse and neglect, poverty, need for leadership within the community and the need for partnerships between parents, teachers and community members in addressing these issues, particularly as they effect young children in the community. The policy does not, however, discuss environmental concerns beyond socio-economic environmental issues, thus representing a socio-economic approach to development as opposed to an integrated approach that involves concepts of sustainable development.

National policy, school policy and context

School policy is generally shaped by the local context, as well as the broader national context of South Africa. The Raglan Road School policy can in effect, be seen to support strong community development aims through this close relationship with local context. The approach of a contextually relevant school policy ensures that the policy responds to and represents issues affecting a specific community, in this case, the community surrounding the school and in which the learners live. However, the school policy does not deal explicitly with educational practice or teaching and learning processes. In other words, the school policy seems to deal more strongly with the implicit school curriculum – that of creating a safety net for children, as opposed to the explicit curriculum which is concerned with cognitive and skills development.

South African national policy, specifically the revised National Curriculum Statement (RNCS), on the other hand, has very little explicit community development focus (DOE 2002). Instead, its focus is on teaching and learning processes, assessment and curriculum guidelines. It is this policy that teachers at community-based centres use to develop and plan lessons, and which they use to shape the explicit curriculum of the school. This can be seen in the way teachers use programme organisers to guide and format lessons and in the way they structure their days, with morning rings dedicated to life skills and afternoon rings dedicated to literacy and numeracy. In addition, national policy provides a structured means of integrating environmental concerns, along with matters of inclusivity and social justice into the curriculum. The RNCS (DOE, 2002:8) states that:

> *The curriculum aims to develop the full potential of each learner as a citizen of a democratic South Africa. It seeks to create a lifelong learner who is confident and independent, literate, numerate and multi-skilled, compassionate, with a respect for the environment and the ability to participate in society as a critical and active citizen.*

The above national policy vision is incorporated into each learning area in ways that allow teachers to explore the interactive nature of a healthy environment, social justice, human rights and inclusivity through educational practices guided by outcomes, activities and assessment. The national policy (RNCS) provides a framework for teachers to interpret their local environment in ways that are contextually relevant through the exploration of contextual issues, within a curriculum framework that provides for a broad range of learning opportunities organised within a framework of eight learning areas; while, as noted above, the school policy tends to focus more on social justice and human rights through a rights-based community development and education approach.

In the case of the Raglan Road Child Care Centre, teachers drew on the national curriculum framework to guide aspects of their lesson planning, particularly programme organisers (as used in Curriculum 2005). However, there was less explicit focus on learning outcomes and assessment standards in their lessons and the outcomes and assessment standards appeared to be more contextually derived (reflected in teacher intentions where, for example, teachers planned lessons in response to contextual issues, and assessed learners in terms of changes in behaviour that might indicate abuse or disruption in family life). While congruent with some of the principles of outcomes-based education, teachers did not explicitly use the outcomes as specified in the curriculum statements to guide practice. It was also interesting to note that teachers still use ‘programme organisers’ as a way of structuring the explicit curriculum, when this curriculum feature is no longer included in the formal structure of the RNCS (DOE, 2002). This indicates a transition process from the first version of C2005 to the newer updated RNCS framework. During discussions about networking and working with the community, one of the teachers at Raglan Road noted that because the RNCS was ‘new’, she

was still unsure about lessons within this framework, and so discussed new lessons with other teachers, such as those at neighbouring primary schools in order to gain understanding of and confidence in adopting the RNCS.

Contextual factors thus appear to amalgamate with national curriculum policy frameworks, to create a way of structuring teaching and learning in ways that partially reflect the explicit intensions of national policy. This discussion has, however, also indicated that for teachers to successfully draw on national policy, there is a need for them to be confident with the 'new' requirements of the national policies, and that they appear to require support in engaging with these requirements.

Arising ambivalence[3]

There appear to be two arising ambivalences within the context-policy relationship described above. The first is in the absence of a strong educational focus in the school policy and the absence of a strong community development focus in the national policy. Although the two policies complement each other when used together, there is a need to vocalise the 'silent voices', especially in the school policy, given that the school is an educational centre that claims to "develop [learners], so that they can be ready to go to school, to another grade" (Nolongo-Siwa pers. comm. 2004). Similarly, there is much that can be learned about contextualisation of curriculum from the community development focus in the school policy and practice. As indicated above, this ambivalence is engaged by teachers at the classroom level (to some extent), but a more explicit consideration of this ambivalence may a) strengthen the school policy, and b) strengthen curriculum policy implementation.

The second ambivalence arising in this paper is between that of school policy in response to risk and that of national policy in response to risk. As argued above, community-based initiatives *provide* an integrated approach to long and short-term risk reduction, especially at a local level, while national policy *proposes* a need for integrated responses to risk as can be seen from the social goals embedded in the RNCS (with little guidance on how this should be achieved). There appears to be a need for national policy to support local policy in ways that enable school policy to continue to address risk through multi-faceted and integrated approaches, given that these objectives are embedded in the social goals of the curriculum. It seems that much can be learned about national and international policy implementation through a closer look at the relationship between context, policy and teaching and learning at a school-based level. It would also seem that, instead of an articulation of school-based and community-based approaches being viewed in oppositional discourses in the ECD policy landscape (e.g. Porteus, 2004), it may be more useful to engage this ambivalence in more complementary ways.

In summary, barriers to ESD within the community-based early childhood development context can be described as follows: The sector experiences challenges associated with poor resource provision, both in terms of qualified teaching staff and material resources, as well as a lack of understanding of the complex relationship between social and ecological systems – thus much of the learning is unconscious and embedded within a social context of risk. As a largely informal and under-resourced sector, the challenges faced by teachers and environmentalists in the sector include restrictions by national policy, under-qualified teaching staff, overwhelming numbers of learners and contexts of grave social, economic and environmental risk.

Ironically, learning in these centres is structured in response to contextual needs, implicitly opening pathways to education and action towards sustainable development, with drivers that are likewise embedded within social risk as well as the need to utilise freely available resources within the natural and social environment to compensate for the lack of state provided learning materials. The very contextual situated-ness of learning and development in these centres, in combination with the low resource content of the sector, act as powerful drivers to sustainable development - both in terms of education and in terms of community development through the provision of safety nets.

[3] "Ambivalence" in the context of this paper refers to paradoxes and apparent contradictions in ideology evident as competing discourses and ideologies. This ambivalence reflects shifting social relations and encodes these different and often conflicting social relations.

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9. The Role of Research in Implementing Education for Sustainable Development in Zambia

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Abstract: Recently, I was engaged by WWF-ZEP to be involved with the Educational Consultancy awarded to them by Zambia Consolidated Copper Mines Investment Holdings Plc. Copperbelt Environment Project. The background information is as follows: Zambia has for the past 90 years been dependent on the mining sector for its economic survival, albeit negative and sometimes harmful environmental consequences accumulating over time. With the privatisation of the mining sector, the Government of the Republic of Zambia through the ZCCM Investment Holdings (ZCCM-H) retained liabilities for a wide range of environmental concerns, which were not passed on to private investment consortia.

The main objective of the Consultancy is to provide an approach and process for mobilizing and utilizing the educational system to raise awareness, promote positive behaviour and build action competence towards environmental protection and restoration related to mining and the environment. The intent of this effort is to increase the community's awareness on the existence and functioning of defunct mining sites including issues related to mining and the environment and promote action competence in the community towards environmental protection and restoration.

The outcome of the project is expected to assist the Government in addressing the environmental liabilities including improving future compliance of the mining sector with environmental and social regulations. The programme will include Copperbelt school children and youths, at Nursery, Primary, Secondary and Tertiary levels. The term 'Environmental Education' was used because judging from the main objective of the Consultancy; it means 'Education for Sustainable Development' since the approach would provide the means for seeking a critical understanding and improvement of society, in this case the Copperbelt.

Introduction

The strategy for the Consultancy includes undertaking a baseline survey to determine the level and extent, to which the educational system can be utilized to raise awareness, promote positive behaviour and build action competence in environmental management related to mining and the environment. This will involve two parts, but I will confine myself to the second part which involves reviewing a few researches done in selected schools in some parts of the world to determine the role that research for sustainable development has played in the process of crossing barriers and creating drivers and then point out how the lessons learnt can be applied to effectively implement Education for Sustainable Development in targeted schools, institutions and communities,

This paper will look at the term 'Education for Sustainable Development', identify barriers within the context of the cited research, discuss how research has helped to cross these barriers and create drivers and what lessons can be learned and be applied to the Consultancy.

Because of limited space, I will just list features of ESD as outlined in the Draft Implementation Scheme of the UNDESD. They are as follows:

Features of ESD

- Interdisciplinary and holistic-learning for sustainable development embedded in the whole curriculum and not as a separate subject
- Values-driven: it is critical that the assumed norms- the shared values and principles underpinning sustainable development are made explicit so that they can be examined, debated, tested and applied
- Critical thinking and problem solving-leading to confidence in addressing the dilemmas and challenges of sustainable development
- Multi-method-debate, experience…different pedagogies which model out the processes

- Participatory decision-making-learners participate in decision making on how they are to learn
- Locally relevant-addressing local as will as global issues, and us.

What role has Research Played in the cited cases and what role will it play in crossing barriers and creating drivers in this particular Consultancy?

I will describe the activities of schools that were engaged in instances of what might count as Education for Sustainable Development and explore the issues arising from such an attempt to realise a socially critical curriculum.

Queenscliff High School began its water quality studies in the coastal region of the state of Victoria in Australia in 1987 as a narrowly focused project and included the monitoring of bacterial levels but, in response to a community environmental concern, changed the focus of its research to a critical study of sewage pollution at their nearby swimming and surfing beaches.

This school's involvement in water quality studies was in part a response to concerns expressed within the student body and within the community at large about the obvious sewage pollution of nearby beaches. These beaches were widely known for their swimming, surfing and fishing and there was an increasing community concern about the amounts of disposable items such as plastic syringes, condoms and sewage finding their way onto the beaches. The school developed a research programme.

The school's investigation showed that coliform bacterial counts in the seawater were far in excess (40 times above the safe limit) of acceptable Environment Protection Authority (State of Victoria) guidelines for safe body-contact and that such readings were common in locations where thousands of people swam, surfed and fished on a regular basis.

Prior to going public with the results of the investigations by providing data to the media, the students and the teachers attempted to discuss the issue with the Water Board that controlled a large sewage treatment plant which voided its effluent into the ocean via an outfall located offshore from the popular beaches, but they were rebuffed. Following these rebuffs, the school invoked the state's Freedom of Information Act to gain access to Water Board's own records of bacterial levels. This disclosure triggered a powerful response from several sections of the community:

- Local state and national print and electronic media ran stories publicizing the school's activities, the issue itself and its relationship to other instances of marine pollution elsewhere in the country
- The local surf-riders association aligned themselves with the school in criticizing the state of the local beaches in terms of sewage pollution
- The local health centre begun to maintain records of complaints about infections and illnesses possibly associated with the bacterial present in the seawater
- Funding support for the school project was forth coming from the government as well as other sections of the community
- Other schools shifted emphases from narrowly focuses water quality studies to seawater pollution in response to community concerns
- The Government requested the Water Board to undertake substantial improvement to their sewage treatment facility.

What barrier did Queenscliff High School face with regards to implementation of Education for Sustainable Development?

The school at first could not differentiate Education for Sustainable Development from Environmental Education-nature study, water quality studies, planting of trees in the school grounds, concerns of litter and 'doom and gloom' current affair topics like the greenhouse effect and the depletion of the ozone layer and this is the state that the Consultancy outlined above is in.

Queenscliff curriculum had been 'greened' and initially, the objective of the water quality study was just to raise the level of awareness in the community about the quality of water. The same appears to be the ultimate aim of the referred to Consultancy, "to raise awareness, promote positive behaviour…" but did that solve the problems arising from sewage pollution of the beaches? On the contrary, awareness just brought about anxiety and this is what the Consultancy will achieve if it stops at raising awareness. Jensen and Schnack (1997) questioned whether creating anxiety and worry in learners is wise or useful. The water quality studies clearly indicated that this approach is inadequate. The two realised that the problem is more how to handle the anxiety that learners already feel and pointed out that there is need, for a form of teaching from which learners can acquire the courage, commitment and desire to get involved in the social interests concerning sustainable development issues.

They stated that in implementing education for sustainable development, the concept of 'action competence' (with its components such as Knowledge/insight, Commitment, Vision, Action experiences and trust in one's own power to influence, Critical thinking and skills such as ability to cooperate and collaborate) should occupy central position. They further stated that Action Competence demarcates the concept of 'action' from 'activity' and 'behaviour change'. According to them, actions are considered, targeted towards solutions of a problem, understood and can be explained with reference to motives and reasons rather than to mechanisms and causes, while this is not the case in a behavioural change, which could be caused by pressure from external forces. Developing action competence therefore, the duo continued, becomes a formative idea in a democratic approach to Education for Sustainable Development. Kimmis et al (1983: 9) state that this approach engages social structures and social issues immediately rather than merely preparing learners for later participation. It engages social issues and gives learners experience in working on them.

How did the School Create Drivers and what lessons does this provide for the Consultancy?

The curriculum orientation for Queenscliff shifted from being academic to being socially critical (action-based) insofar as the teachers and learners treated society as problematic. The curriculum orientation was no longer 'behaviourist', concerned primarily with the transmission of knowledge, but provided the conditions for learners to appreciate social reality. This provides the Consultancy with an insight as to the gravity of barriers expected. Our school system in Zambia is still examinations oriented and the school timetable is never tampered with especially for examination classes. Education is only valued if it can be examined and paper qualifications issued. How will the Consultancy persuade the school/college authorities to shift their curriculum from being academic oriented to being socially critical?

It should be noted that even at Queenscliff, it's not the whole school that was involved but only two classes. Was the choice of the two classes "Year 11 Marine Studies and year 12 Biology" by accident or by careful consideration in terms of the nature of subjects involved and the level of learners? It appears that the socially critical curriculum, no mater how much the community appreciated that the school undertook initiative in the community for positive community change, had to be fitted into a carefully chosen existing interdisciplinary curriculum (Marine and Biology) to minimise the modification of the school timetable to enable protracted field work for the learners. The same choice may have helped the school to convince the broader community, (which may not have valued the socially critical curriculum for all the 'working knowledge' and rich unique experiences it offered the learner) that it would reinforce the academic curriculum, which ended up being examined. This guides the Consultancy that the curriculum in which the socially critical curriculum is to be fitted should be carefully chosen to avoid causing unnecessary anxiety about the school timetable and whether it is not going to affect learner's academic performance negatively. The school set a perfect example of how to implement education for sustainable development-interdisciplinary and holistic (embedded in the whole curriculum and not as a separate subject). This created a driver and attracted community support instead of the usual community resistance to change. The broader community perceived the focus of the school research as socially significant in that it evolved into a general and sustained community endeavour to resolve a serious environmental problem.

What was the learners' level of involvement/participation?

We are informed that through enquiries, learners developed their own 'working knowledge' of relevant constituencies in their community such as the surfers and the medical centre, sought critical understanding of social structures and relationships (such as the powerful influence of the Water Board) appraised this information and acted with some community agencies (such as the media) to change a social practice (in this case the disposal of sewage wastewater). Direct involvement in data collection entailed collaborative work (collecting water samples, conducting tests, compiling results).

This guides the Consultancy as to the level of learners it should involve, taking into consideration the social problem at hand "existence of defunct mining sites including issues related to mining and the environment". The level of participation expected can only be achieved at high school and tertiary levels and certainly not at primary and nursery school levels as the Consultancy indicated. Indeed all the learners need education for sustainable development but this project demonstrated that the idea of a 'universal' curriculum and the idea that 'textbooks' are a prime source of worthwhile knowledge are inapplicable in a socially critical curriculum. Different schools and different levels can focus on different challenges being faced in their communities.

The role of teachers included modification of the school timetable to enable protracted outdoor fieldwork, identification of resource people, (external) to help solve problems being experienced by participants, establishment of links with community agencies (community agencies depended on the school for scientific information about bacterial levels and the school depended on the community for funding, technical support and visibility) such as print and television media, the local Water Board, the local university, and marine science laboratory and encouraging the writing of reports by learners and colleagues. This has helped to clarify who plays which role? And that sometimes unforeseen problems may arise for which resource persons have to be identified and it would be wise to consider this hidden cost when budgeting for the Consultancy.

What if Education for Sustainable Development has already been implemented, does research still play any role in crossing barriers and creating drivers?

In the autumn of 2001, Vasterbergsskolan in Molndal joined the project 'Dare to Break the Mould', a three-year gender equality programme in Western Sweden. The team, together responsible for 76 children aged between 6 and 11, began by videoing each group of children with their teacher. This was done to see whether the teacher's interaction with boys and girls followed a definite gender pattern. They also looked at whether boys and girls behaved differently during the session. And they did! The boys talked, asked questions, disregarded rebukes, clowned about and made themselves noticed. The result was quite a shock to the teachers. "We were sure that we treated girls and boys the same. But we didn't! It showed clearly that the boys grabbed our attention by acting out, while the girls obligingly accepted second place. It was even evident from our tone of voice what we expected of them. After this unpleasant surprise we paid more attention to our approach."

Based on this film, a teaching plan was worked out for enabling boys and girls to broaden their experience and develop without the restraint of traditional gender roles. The girls needed to learn to make their presence felt and believe in themselves. Not to feel ashamed or feel guilty. They also needed to practise daring to compete and daring to win. The boys needed to practise listening to the people, learning to read other people's signals and showing consideration. The aim was for both boys and girls to develop positive gender identity.

Teachers thought they were effectively implementing education for sustainable development focusing on the Gender Equity issue by allowing boys and girls to participate in activities that are normally associated with the opposite sex. Little did they realise that their own attitude and approach to the issue formed a barrier. The research helped teachers to cross this barrier when they watched a video of themselves depicting an approach, which promoted gender inequality. This at once created a driver in the sense that the school modified its teaching

approach. So the answer is yes, research provides practitioners with an opportunity to assess themselves.

This Paper has demonstrated how research can help to cross barriers and create drivers by:

- Clearing misconceptions about what Education for Sustainable Development really is because practitioners cannot implement what they don't understand.
- Providing a clearly defined process for implementation, lessons/guidelines and encouragement as discussed above.
- Act as a mirror in which practitioners can view their reflections and correct their own mistakes if necessary.

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10. Pupils' Conceptions of the Greenhouse Effect —An Example from Chinese Green Schools

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Abstract: The paper presents preliminary results of a study conducted in three different green schools in the Beijing area. Three groups of fourteen year olds were interviewed about the greenhouse effect. The pupils' interpretations with regard to solutions to polluting factories and increasing number of automobiles are presented in the paper. The pupils are found to face perplexity while trying to solve real-life issues. They also maintain pessimistic view towards the future of human beings and the planet earth. In addition, the ambivalence between a pupil's knowledge and his potential action is also surfaced. In light of the preliminary findings, it is argued that it is biased to stress a relationship between nature and people, which may nurture an eco-centric perspective. Additionally, for the educators specializing in sustainable development, cautions should also be taken not to make the pupils over-laden with too many problems.

Introduction

China is marching on two paths that are not entirely compatible—rapid economic development as a means to economic prosperity, and environmental protection to ensure a sustainable economy. China's speedy economic development and soaring energy use has made it a transparent fact that whatever measures or steps China takes now will have profound local as well as global repercussions.

Although the dilemma of economic and environmental development is more pronounced in the developing countries, and particularly in China, it is, however, a problem facing all governments in the world. Living in the globalized world, China's positive change in responding to the aforementioned pressure will undoubtedly benefit the world. This is not simply a local or even regional problem, but a global one. Thomas Östros, the Swedish Minister for Industry and Trade recognized after a visit to China that the severe problem of air pollution has contributed greatly to the greenhouse gases with global consequences (http://www.sweden.gov.se/).

This paper presents preliminary findings from three group interviews conducted in three different green schools in the Beijing area, China. A green school is also called an eco-school, which pays more attention to environmental education compared with other ordinary schools. To have the honorary name of a green school, a school has to meet some harsh national standards. Therefore, it is assumed in this study that the pupils in a green school should have more environmental knowledge than their counterparts in other schools, or at least have heard of the greenhouse effect in the case of this study. The reason for conducting the study in China is due to China's explosive economic development on the one hand, and its steep cost to the environment on the other. But the dilemma of improving economic standards and at the same time protecting the environment is one facing all countries in the world.

The paper presents how the pupils try to cope with two real life issues concerning factories and cars. The preliminary results outline the pupils' bewilderment when coping with real life issues, and their pessimistic view towards the future of the earth. It is argued that it is biased to stress a relationship between individual and nature regarding environmental issues. The relationships between individual and society, and even society and nature have to be taken into account in the educational settings.

Research on learning in environmental education

A review of over one hundred studies between 1993-99 on learners and learning concerning environmental education shows some general features as well as deficiencies in the whole picture (Rickinson, 2001). The studies are found to be more about learners than learning. Research on learners' learning processes is scant. Students are depicted as individuals whose environmental knowledge, attitudes and behaviors need to be understood in order to be more effectively altered through educational interventions.

In light of Rickinson's review, it has been observed that the research for environmental education has been following the trajectory of science education. This means that efforts have been made in order to replace pupils' prior knowledge based on daily experience with scientifically approved knowledge, which has a focus on the cognitive dimension. However, the significance of addressing dimensions other than cognition has been touched upon by considerable studies (Ekborg, 2003; Grace & Ratcliffe, 2002; Halldén, 1999; Slingsby & Barker, 2003). The relation between a learner's abundant environmental knowledge and his behavior and attitude to the environment is found to be not necessarily proportionate (Slingsby & Barker, 2003). Students are found to be unable to deploy their scientific knowledge to discuss authentic or real-life issues (Ekborg, 2003) and more attention is called for the relationships of human and whole ecosystems, economic systems, social systems as well as political systems in teaching (Duan & Fortner, 2005). Lundholm (2004) investigated how civil engineering undergraduates understand the content and structure of an ecology course. The findings show that students interpret the content in plural contexts, where also lies students' learning difficulties. They are found to elaborate both within a context and between different contexts. The students had substantial difficulty separating different subjects, as well as subject matters, values and emotions.

The findings of the research previously discussed share a sense of common ground that more research focusing on both the social science and natural science dimensions should be carried out instead of solely making the natural science aspect their primary foci.

Methodology

Participants and data gathering

The interviewer of the present study is a teacher of biology working in the Beijing Education Institute. She was given the job of data collection due to her own willingness and her biological expertise. Five groups of pupils (three pupils in each) aged thirteen to fourteen from five green schools of diverse socio-economic statuses in the Beijing area participated in the interviews based on their own consent. The selection of the schools was based on an assumption that pupils of different socio-economic statuses might have different interpretations regarding the greenhouse effect other than its biological connotation. For example, it may be more incompatible for an individual (e.g. relying on coal mining as a livelihood) of a disadvantaged family on the one hand to protect the environment and on the other to strive for survival and better socio-economic status, which may be attained at the cost of the environment.

Each interview lasted some fifty to sixty minutes. The interviews were recorded in a digital recorder by the interviewer first, and then sent to the author via Internet. They were transcribed verbatim into Chinese and then translated into English by the author. Certain problems due to the translation were inevitable, but original meaning was kept as closely as possible. *'I'* in the excerpts stands for the interviewer. Possible notations and omissions in the dialogues are found in the brackets. The preliminary results presented in the paper are based on three group interviews.

Assignments

For the data gathering, five assignments have been designed around the pivotal theme of the greenhouse effect. Initially, the pupils were informed that the talk would revolve around the concept of the greenhouse effect and they were offered some pictures as food for thought. The first assignment includes two pictures depicting how a rural spot changed into a busy city within fifty years or so, the purpose of which is to investigate pupils' interpretations of the greenhouse effect in the practical situation by referring to pictures showing changes of life. The second assignment includes two other pictures showing how a wetland changed into a dry land within fifty years. The purpose is to investigate the pupils' interpretations of the greenhouse effect in the practical situation by referring to pictures showing changes of landscapes. The purpose of the third assignment is to investigate pupils' scientific knowledge of the greenhouse effect by asking them questions in a more straightforward way. The fourth assignment is intended to make pupils reflect on the foregoing discussion on the meta-level. Finally, the fifth one is to

investigate the pupils' sense of responsibility by showing them a city with deteriorating environment.

Results

In the preliminary results, one idea was found to be of particular prominence and interest: How do the pupils propose a way out for the polluting factories and the increasing number of automobiles?

1. How to cope with the polluting factories

An eco-centric perspective

The works of the Norwegian eco-philosopher, Arne Naess ignited the debate of 'deep biology', the starting point of which is that ecosystems have value in themselves and they have to be protected for their own sake (http://www.nancho.net/advisors/anaes.html). This view towards ecosystems or nature akin to religion is basically bio-centric (cf. Kahn, P.H., Jr., 2002). A bio-centric or eco-centric perspective is interpreted as "nature is valued in its own right and not in the interest of man" (Lundholm, 2004, p.301,). Contrary to her study on college engineering students who are aware of the biased content of the biology course, which stresses problems and destructions of human to nature, some pupils in the present study show an unequivocal and constant compassion for the environment. Considerable sympathy and respect is accorded to the environment, which is perceived as being unfairly treated and gravely destroyed. Humankind is blamed for the destructive process of urbanization and the mistreatment of the environment. Here is an example:

Excerpt one (group two) Li: How to cope with the polluting factories?

Li: These are some small factories, aren't they? They should be, all of them, forcibly, shut down if they do not install environmentally sound equipment!
I: Who would shut them down?
…
Li: Government.
I: The government. Would there be any influence to the life if they were shut down?
Li: The greenhouse effect will be reduced in that case. And if people … if they plant more trees, it will gradually restore to the situation as shown in the third picture.
…(Omitted)
I: I'm wondering what the workers would do it the factories were shut down.
Li: Workers? They would go to farms, of course.

In the omitted part, the interviewer tries to remind the pupils to consider more consequences of shutting down factories, but Li and another pupil, Chen, keep on talking about the benefits for nature. The interviewer however, seems to remind Li to consider the consequences to people and society by virtue of closing factories, which is shown from the word *"life"*. Li, nevertheless, still seems to engage in the environmental provenance. Seeing Li's failure to seize her point, the interviewer eventually asks Li straightforwardly to think about the workers' livelihood, to which Li seems to have insufficient consideration however: '*Workers? They would go to farms, of course.'*

A sense of pessimism

The preliminary findings have also revealed a strong sense of pessimism among the pupils about the future fate of the earth and human beings. Pupils have initiated among them the discussions about environmental problems of both global and local importance such as global warming, sand storm, deforestation, desertification, water and air pollution, and so forth. The consequences of these problems will inevitably lead to the perishing of all living beings and the earth per se according to the pupils. Zhu, a girl in the third group states, '*that means the earth is hot already now, and it would be even hotter then. All people would die. After their death… so many people would all be dead. If so much chilly ice on the south and north poles vanished, the tropic zone would be definitely hotter. And people would not only be unable to survive…*'

2. How to cope with the issue of cars

The topic of cars initiated hot discussions among the pupils. They have in general acknowledged that auto emissions are a major contributor to the greenhouse gas CO2. They have also realized that large gas guzzling cars are more harmful than smaller ones to the environment. However, in the following excerpt, Li has reasoned in a very explicit way that he prefers a bigger car irrespective of his knowledge about its potentially bigger harm to the environment. He has tried to cater for the interviewer at first but changed his mind when asked to provide his innermost thought about the issue. Huang, another boy in the group, chimes in with Li immediately.

Excerpt four (group two) Li: Cars, big or small?

I:	*Suppose you were living in the place and were richer. You were to buy a car. Were you to buy a big one or small one?*
Li:	*A small one.*
I:	*Why?*
Li:	*It's easier to drive a small one.*
I:	*Mm.*
Li:	*And less pollution to the air.*
I:	*Do you mean what you say?*
Li:	*Not really.*
I:	*Then please tell the truth.*
Li	*The truth is that I will buy a very grand and gorgeous one.*
Huang:	*Yes!*
I:	*Why?*
Li:	*Certainly in order to show off.*
I:	*Ha ha…show off. You said just now about the big discharge of auto-exhaust. Big discharge, so what?*
Li:	*It is pollutive to the air.*

From the angle of sustainable development, it may be reasonable to say that the more people drive, the more harm they do to the environment. However in the Chinese context in which everyone's economic life is undergoing dramatic improvement, owning a car, and a gorgeous one is perhaps many peoples dream. What responsibility towards society and nature does each individual have? Should an individual choose between one's personal dream and social responsibility? Perhaps Li and Huang would choose to realize the former.

Discussion

An individual-nature relationship

The paper has presented some preliminary results based on interviews and group discussions from three Chinese green schools with different socio-economic statuses. However, no conclusive point can be drawn so far about how the pupils' socio-economic standards may influence their interpretations concerning the greenhouse effect.

The preliminary findings show however that some pupils maintain a perspective of bio-centricity, in which the environment is deemed as being gravely mistreated and harmed by humans. There is therefore a strong sense of pessimism among these pupils about the fate of the planet earth and all human beings. The bio-centric perspective may also be interpreted as one that stresses relations between humankind and nature, in which nature has value in its own right and also for the sake of all living beings. Nature thus needs to be carefully protected against any negative impact from human beings. This perspective may lead to the pupils' perplexity in coping with real-life issues.

A relationship involving people, society and nature

While trying to cope with complicated real-life issues, some pupils realize that the actualization of people's well being may inevitably bring harm to the environment. Here is where the social dimension is brought into consideration. What is good for nature? What is good for the society?

And people? Where is the equilibrium point set? Although this is a contradiction confronting all nations in the world, it is more pronounced in China, which is undergoing dramatic socio-economic transformation.

The aforementioned examples may well indicate how the pupils are in a quandary when coping with issues, which involve dimensions of not only nature and people, but also societal aspects. The examples under the title of *How to cope with the issue of cars*, for instance, involve not only a relation between nature and individual, but also relations between individual and society: Should I or should I not make a change as a social citizen? Should I renounce my personal dream of purchasing a car for the sake of the environment? In addition, a relationship between nature and individual is also bridged: Factories as an economic pillar and environmental culprit at the same time.

Implication for education

One question in responding to the preliminary findings may sound like a cliché: What is ESD? The above examples show how the pupils are bewildered facing dilemmas. Is this the purpose of ESD? Is it wise to put pupils into dilemmas? What can be gained from this? It might be a case that the world is already full of dangers and threats to children such as violence, parental divorce, disease and so on. If the education for environment or sustainability continues to heighten the problems, perhaps pupils will be over-laden. It is after all not a good sign to sense the pessimism among the pupils in the preliminary findings.

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11. Curriculum Content in Light of Education for Sustainable Development – Some Proposals

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Abstract: Education for sustainable development is not a separate undertaking but something that concerns the whole school curriculum. Therefore, analytical tools that help handling this situation are needed. One such tool is proposed in this paper, called 'an overall picture of teaching about the world'. It consists of four interacting parts, namely 'the school subjects', 'orientation patterns', 'everyday knowledge and experiences' and 'problems concerning nature, technology and society'. The idea of orientation pattern is elaborated by an example called 'Energy flow on Earth', depicting in some detail humankind's s energy situation.

An overall picture of teaching about the world

Education for sustainable development is a multidimensional undertaking. A good illustration of this is the following general aims that have been proposed by Öhman (2004):

The students should:

1. Be given a chance to orientate themselves among existing viewpoints and opinions
2. Achieve knowledge in order to be able to critically evaluate alternatives
3. Develop an ability to take action regarding sustainable development issues

Within this broad orientation, the present paper focuses on the second aim by suggesting and exemplifying some ways to think about and organize curriculum content in compulsory school. Consider figure 1 for example. A first observation is that traditional subjects are part of it. They do not themselves answer present day questions about e.g. environmental problems and health but they provide necessary knowledge for describing and analyzing such questions. The traditional subjects may be looked upon as a basic resource for understanding the world, and perhaps teaching about appropriate key ideas in various subjects should be sequenced rather systematically during the compulsory school years.

Another part of figure 1 is called 'orientation patterns'. By this is meant patterns that help students to orientate themselves in the world in a better way than pure subject structures or various types of everyday experiences do. In other words, an orientation pattern is thought of as a more effective interface between the individual and the surrounding world than traditional subject matter and everyday knowledge. An example of such a pattern is given later in the paper.

The field above and to the right in figure 1 concerns present day problems, e.g.:

- What can be done to slow down the enhancement of the greenhouse effect?
- What can be done to achieve a more sustainable use of energy?

In order to analyze and discuss such questions it is necessary to choose a system for reasoning with the parts *nature*, *technology* and *society* and integrate relevant subject matter knowledge, everyday experiences and understanding of orientation patterns.

Everyday experiences and everyday knowledge are also part of figure 1 since they are important resources for understanding, and acting in the world. They are the student's point of departure for grasping e.g. science, and it is the teacher's job to help the student reorganize everyday conceptions into new modes of seeing the world. Everyday experiences are also important since they manifest what it means to be a person, a human being. The students' interests, passions, doubts, dreams and moral values are anchored in their lived experiences and all this should of course find expression during lessons and related contexts.

Figure 1. An Overall Picture of Teaching About the World

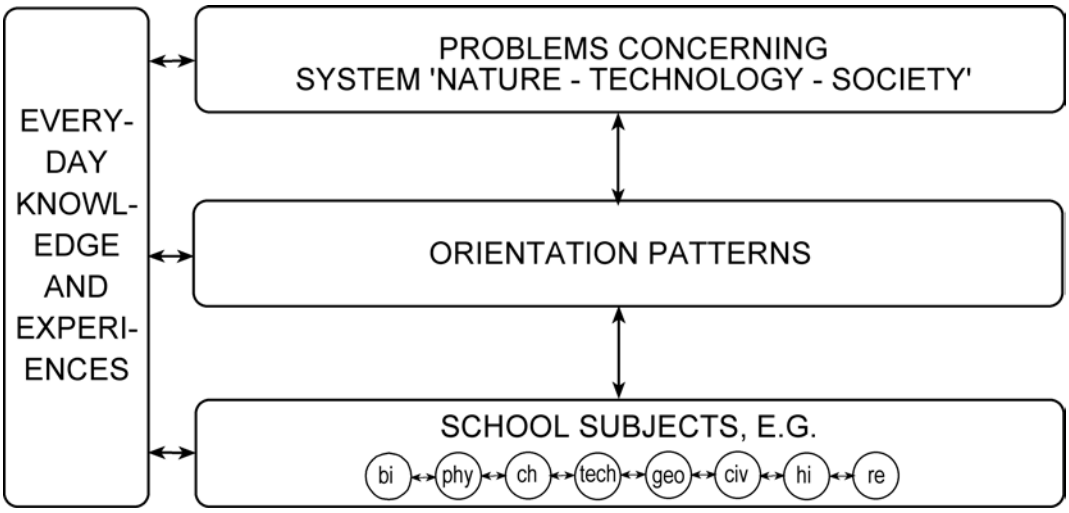

Figure 1 is an overall vision of how school might approach teaching about the world. The key idea is well-reasoned development of subject matter knowledge and orientation patterns in interaction with interesting and important problems and including the lived experiences of the students. The figure depicts a win-win situation both for subject matter teaching and education for sustainable development. The students are given opportunities to find out that subject matter knowledge helps them understand the world. And subject matter knowledge might be experienced as both meaningful and relevant when used in the context of sustainable development.

The energy flow on Earth – an orientation pattern

An example of an orientation pattern called 'The energy flow on Earth' is given in figure 2. The point of departure is the fact that the Earth is in a flow of energy. Short wave radiation hits it and long wave radiation leaves it. The figure shows how incoming energy from the sun – several hundred thousand TW – branches out along different flow-lines. Nuclear energy is also included. Man currently uses somewhat more than 14 TW, and of these, about 11 TW come from limited supplies (oil, coal, gas) and somewhat more than 2 TW from renewable energy sources (essentially water power and biomass).

Figure 2 shows links between phenomena that are not obvious to the ordinary observer. The photosynthesis of plants transforms incoming radiant energy into chemical energy, which is stored in the 'oxygen-biomass' system. This is the only source of biological energy ('food'), directly or indirectly, for animals, including the human race. This energy can also be used as fuel. It is further evident from the figure that ancient organisms have been transformed into oil, coal and gas. This means that the energy in the system 'oxygen-fossil fuels' might be seen as solar energy transformed through photosynthesis by ancient plants.

Another example is switching on a light. This starts an energy transfer that might be traced back to the sun, too. Solar energy has been transferred to water, which has evaporated. Water vapour has risen, condensed, fallen as rain or snow and been collected in reservoirs at higher levels. The increased potential energy of the 'water-Earth' system is then transformed into kinetic energy, thereafter to electrical energy, and then to light and heat.

In other words, you can say that figure 2 shows links between phenomena that are not obvious to the ordinary observer, e.g. 'solar radiation, photosynthesis, motoring', 'solar radiation, precipitation and domestic lighting', etc. Another thing that becomes apparent is that electric energy is not necessarily 'clean' and 'environment-friendly'. The greater part of it is generated through the combustion of fossil fuels – something to think about for anyone who advocates a transition to hybrid vehicles.

Figure 2. Energy Flow Through Nature and Society in 2003 (Unit 1 TW = $1 \cdot 10^{12}$ W)

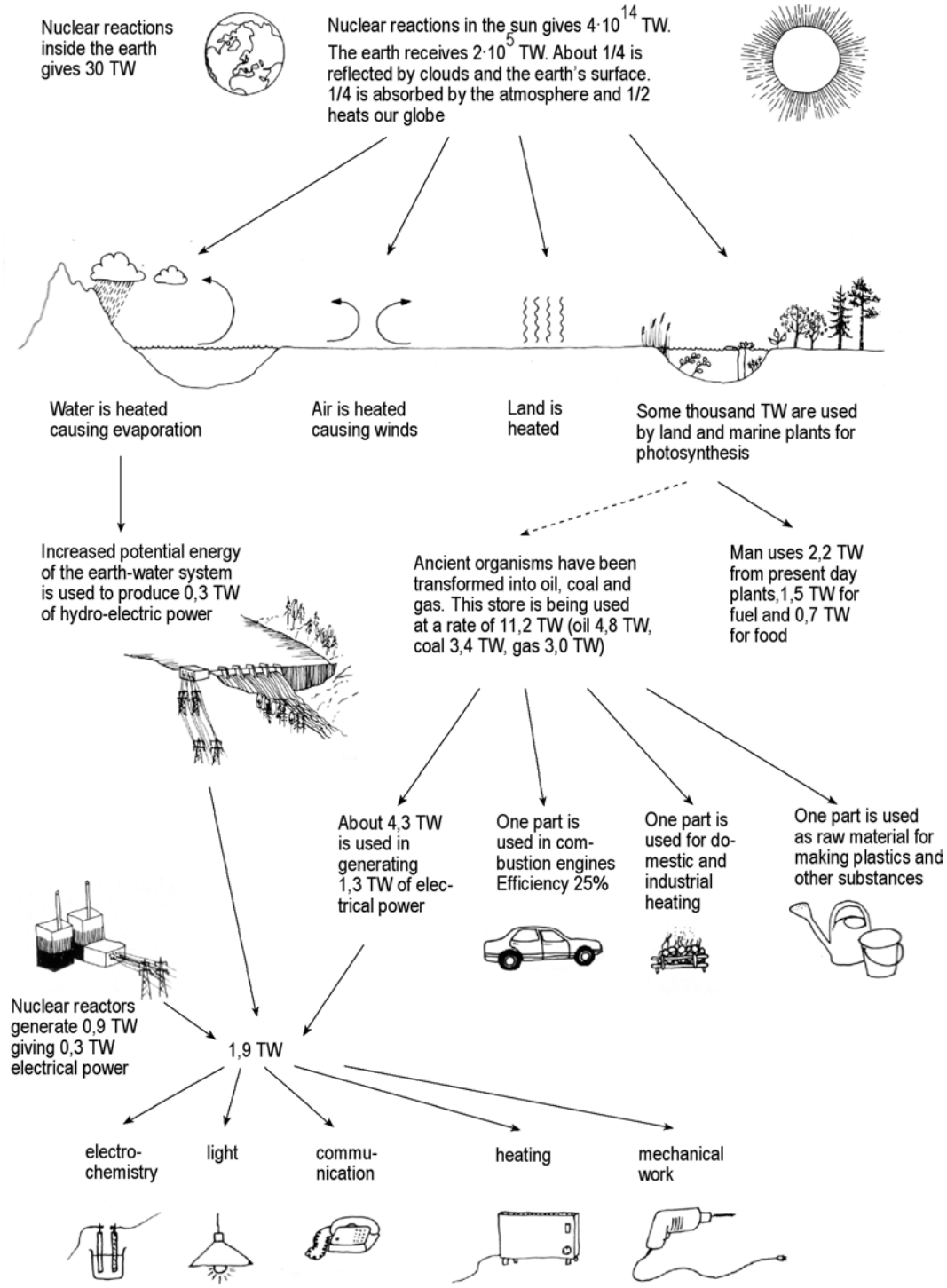

Figure 2 shows how nature, technology and society are linked together. The energy flow originates in nature, e.g. solar radiation and ground heat. It is linked into human society with the help of technical systems. How this is done depends on available knowledge, economic circumstances and political decisions. The rate of flow along different flow-lines is significantly influenced by the behaviour of individuals. The use of energy affects the shape of our society and living conditions and has repercussions on our natural environment. The energy flow continues out into space. We live on the quality difference between inflow and outflow.

Non-renewable sources of energy

Of the energy that flows from nature into human society, about seventy-five percent comes from oil, coal and gas. The contribution from nuclear energy is about six percent. An approximately correct idea of the relative proportions of fossil and nuclear energy may make it easier to understand the tremendous adjustment required to do away with dependence on oil, coal and gas including the very large expansion of alternative systems that is needed. An important point is that oil and gas resources are limited. One measure of how long known reserves will last is what is known as the R/P ratio. R is the amount of known extractable reserves, P the annual production. In 2004 the oil ratio for the whole world was 40 years (British Petroleum 2005). For the Middle East it was 82 years. The ratio for gas for the whole world was 67 years, for the Middle East 'more than 100 years'. For coal the world ratio was 164 years. The times stated may change. They depend on politics, patterns of consumption, world market prices, discovery of new deposits and technical advances. There are, amongst other things, large amounts of oil in oil shale that are uneconomical to extract at the present level of world market prices.

The problems with combustion of fossil fuels are widely recognized. One is the emission of such large amounts of carbon dioxide that the climate can be affected. The acidification of soils and water is another undesirable effect. The risks of nuclear energy are also well known. Reactor breakdowns have happened and long-term safe terminal storage is technically very difficult to bring about. These problems, as well as the fact that oil, coal and gas constitute a finite resource, are reasons for cutting down on the use of energy. Figure 2 shows various sectors where savings can be made: transportation, heating, use of electricity, and use of materials.

Connecting personal use of energy to the global pattern

With figure 2 as a starting-point, the student can acquaint him/herself with the energy flow in more detail, through various sub-systems, and think about how to achieve a better energy economy. One example is the home. It is, of course, desirable that students should have a clear idea of the energy flow through a home and what can be done to reduce it. Since electricity bills do not specify individual items people in general probably have little idea of what the different items cost and where savings can best be made. School can make up for this in teaching.

Another issue is travelling. Car traffic is the dominant mode of transporting people in Sweden. It is desirable that the students get some knowledge of what this means from the point of view of energy and the environment. One of the things that seems important for them to know is the flow of energy and matter through a car engine, especially if you take note that there are more than half a billion cars in use on our planet. Perhaps knowledge of the energy and environmental aspects of travelling may stimulate young people to continue as adults with something they are accustomed to, namely using public transport.

A third example is modern food production, which from an energy point of view runs at a loss. Altogether, it is estimated that approximately five times more energy is required to get the food on the table than is supplied to the body by the food-oxygen system (Hubendick, 1985). The auxiliary energy is fairly evenly distributed among the items agriculture, handling/transport and preparation.

The Energy flow on Earth as a context for subject matter teaching

The 'Energy flow on Earth'-pattern is an interesting context both for applying and introducing science concepts. Photosynthesis is an example. By 'inserting' the teaching of photosynthesis into the orientation pattern the significance of this endothermic reaction to society becomes obvious. The same thing can be said about combustion of organic substances, i.e. exothermic reactions. Nuclear physics, electromagnetism and petrochemistry are other subject matter areas that can be connected to figure 2.

Many teachers can be energy teachers

All changes in the world around us are evidence of energy transfer. As far as science is concerned, this means that every event can be analysed with regard to the energy

transformations taking place – not only the physics teacher but also the chemistry and biology teachers can be energy teachers. Further, it is noted that an aim for design technology is to make systems as energy-efficient as possible – an obvious thing for the technology teacher to clarify. And all the problems associated with global, national and personal use of energy also provide geography and social studies teachers with important roles. In other words, many teachers can be energy teachers.

For further reading:

Three members of the Gothenburg Science Education Research Group (see http://na-serv.did.gu.se) have investigated aspects of students' knowledge and understanding of the Energy flow on Earth pattern, using representative national samples (Andersson, Bach & Zetterqvist, 2002). A paper describing their work is available as a pdf-file at: http://na-serv.did.gu.se/publist/pubfiler/energy.pdf

As part of an effort, initiated by the Nordic Council of Ministers, to communicate research results and new ideas concerning science education to teachers in the Nordic countries, a workshop called 'The flow of energy through nature and society' has been developed. It includes among others a concise, partly pictorial, history of the energy flow on earth, comparisons of per capita biological and technical energy expenditure for different countries, information regarding students' reasoning about energy and explanations of how the numerical values in figure 2 are estimated. Hopefully, the workshop demonstrates the considerable educational potential of the orientation pattern 'The flow of energy on Earth'. A version in English is available at: http://na-serv.did.gu.se/publist/pubfiler/eflowshop.pdf

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12. 'Telling Tales' of Sustainable Development in Education

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Abstract: Discourses about sustainable development in education are often investigated:

a) *Conceptually*, e.g. concerning the adequacy and fitness for purpose of policy and practice;
b) P*henomenologically*, e.g. in terms of lived experiences of sustainability; or
c) *Hermeneutically*, e.g. regarding how and why key terms and themes are interpreted in particular ways by the actors and stakeholders in education and sustainable development.

In this paper we highlight a focus of inquiry and debate that helps illustrate the links between the three approaches; namely, attending to the discursive features of the 'tales that are told' about sustainability and which variously inform and shape discourses about 'people, planet and the future' within educational settings and scenarios. How a sustainability narrative addresses such themes offers a focus for deliberations about our awareness, confidence, and creativity regarding the sustainability stories we might find ourselves in or being told in the contexts of teaching and learning, as well as how such stories are variously generated, drawn upon and contested in Learning for Sustainable Development. We start the paper with an introduction to some of the key elements and issues in such work, then sketch some of their potential applications to examples from the field. Key issues to consider are: (a) how narratives enframe the discourses of sustainability in education, and (b) how stories are inflected therein, offering *context* and *text* for Learning for Sustainable Development.

Introduction

> *"Our society has become a recited society, in three senses; it is defined by stories* (recits, *the fables constituted by our advertising and informational media), by citations of stories, and by the interminable* recitation *of stories."*
> *Michel de Certeau,* The Practice of Everyday Life *(1984, p.186)*

The narrative turn in the human sciences has led many scholars and students to consider the role of stories and story-telling in a wide range of social settings, as well as the value of the insights and resources that literary theory and critique can bring to subject areas and domains outside their usual purview of literature and literacies. Taking the basic elements of a story as a case in point, in the context of sustainability and education we might scrutinize what is presented *in* or *as* 'Learning for Sustainable Development' in terms of the key facets to 'its stories'. Identifying the features affords analytical and pedagogical routes into the structure and purposes of the text, as in investigating the use of: plot, character, setting, tone, point of view, theme, arcs, moments, change, juxtaposition, *peripeteia*, development, relationships, desire, conflict, struggle, obstacles, suspense, resolution, relevance, syncopation, progress to and regression from climax. More concretely for Learning for Sustainable Development, we might ask: *Who is seen as the main protagonist/s in achieving or blocking sustainable development in such stories? What is the setting and timeframe for this 'episode' in the larger story of sustainability and how successful does it appear to be in reaching the intended audience?* And, *how does the narrative arc of this story fit with, disrupt or reinforce others circulating in schools and society about 'people, planet and the future'*—to recognise but three 'essences' and questions for examining stories about sustainability in education.

Engaging with such questions may require us to do little more than start by noting and reflecting on the presence or absence of different story elements in a sustainable development discourse within an educational context or setting. It might lead to, perhaps, addressing the observations and our or other's critiques of the findings in the planning and reworking of both intended and actual experiences of the curriculum by students and teachers. While these activities have some merit, we would go further, suggesting that the elements in themselves are seldom as interesting a focus as how they are integrated as a narrative—for example, exploring how the story comes alive, surprises, bores, or convinces us of the power and authority of the story and narrator on the one hand, or perhaps, resonates with our lives, on the other. Indeed, the

quotation at the start of this section suggests to us that we should not excuse ourselves from considering the role of stories (including their production and telling, or construction and circulation) in how we make sense of sustainability, in education or elsewhere. As we hope to show here, doing so can stimulate assessment of their implications for educational and sustainability projects more generally, alongside their relevance to the themes of this publication and how Learning for Sustainable Development is being—or may be—realised, in diverse settings and contexts for learning and teaching.

Evaluating narratives about sustainability and Learning for Sustainable Development might continue then with exploring the adequacy, generation and reception of the stories teachers and learners tell about 'people, planet and future'. It may also consider the moral standing or ethical weighting of such discourses. To illustrate, we might ask whether a sustainability story suggests that we learn 'responsibility' and act 'responsibly' towards 'people, planet and future' (Nikel, 2005), or whether it is about something other: perhaps more nuanced, unusual or contrary, as we investigate who or what we are being held responsible *to* or *for*?

Whether a story flows from the mouth of a Brundtland or a Bush, a teacher or an activist, pursuing such lines of inquiry will soon illustrate that narrative analysis of the very many conceptions and discourses of sustainability that such stories articulate reveals: (i) not just something about the variety of stories that might be told about 'people, planet and future' [or for that matter, how they are told, or which are worth telling], but also (ii) that the narratives draw on and contest the 'majority' and 'minority' reports that have come to inform the discourses and stories that represent and legitimate sustainable development in the public sphere in very different ways—be they 'tales' that work at grand scales (like the statements and debates at the international summits of the UN at Rio and Johannesburg) through to stories at local levels (in, say, a community's attempts to deepen the sustainability of consumption patterns); within education itself (through the responses of teachers and learners to Learning for Sustainable Development), or in other institutions or gatherings of society (which might be characterised, for example, as religious, financial, social, or recreational, and where the focus might be upon the value, profile and trajectories of sustainability narratives amid and across such categories or distinctions).

Furthermore, we might also consider that just as a particular discourse of sustainability may mingle with related and unrelated other discourses (for example, in schools, those of classroom management, assessment and evaluation, teaching and learning styles, etc). in much the same ways that conversations do—in that they ebb and flow, jump, merge, deconstruct, pause, reconnect and so on with diverse streams and accounts of experiences, ideas, passions and struggles—such characteristics of discursive events can suggest that despite a desire in some quarters for simplicity about sustainability and its communication, it may actually be little more than bad faith not to acknowledge the challenges and realities of such a rich, complex (and fraying?) fabric of ideas, practices, imperatives and tensions, acting as the backcloth for educators and learners in addressing the aims and practices of Learning for Sustainable Development in classrooms and other settings for learning and teaching.

Of course, we should also note that such a 'fabric' to a discourse affords its interlocuters a wide range of possibilities and 'utterances' about learning, society, the self, the body politic, economics, nature, history, ethics, and so on. And within this, some streams of discourse clearly seek to appeal to high-level imperatives and injunctions to pursue sustainability while others will oppose these; some will demonstrate lack of clarity and certainty about how to proceed in pursuing sustainability while others will offer direction and strategy; and so forth.

To stretch the metaphor further though, we note that in the presence of such multi-threaded, multi-coloured discursive tapestries acting as the backcloth for Learning for Sustainable Development, there will also be some sustainable development discourses that are regarded as poor and shallow and others deeper and richer in terms of the questions they raise, for example, and the answers they offer, about sustainability. Moreover, from a narratological perspective, it is in the very existence of such a diversity of stories that we might find each discourse—no matter what its level of credibility—being able to lend meaning to the others, and hence directly or indirectly shaping our various estimates of sustainable development, and what

Learning for Sustainable Development might or should (not) entail. Consider for a moment the example of what might be implied by the contrasting notions that sustainability must be 'engineered' or that it is an 'emergent phenomenon', and then their implications for Learning for Sustainable Development in terms of whether teaching and learning working with these scenarios is primarily about asking better questions or providing better answers?

What is at issue here then is establishing the usefulness and limits of a sustainability story, recognising that narratives are executed in a particular style (or amalgam of styles) that are connected to a particular time and culture, and attending to the notion that meanings and interpretations often form part of the discourse as opposed to being 'things' separate from it. Narrative analysis invites us to take seriously the thesis that there are no brute facts of sustainability without an interpretative frame that is also implicated in their communication. And in being faced with such a state of affairs, we will not be able to exclude the possibility that meanings and interpretations of sustainability may later be challenged, deepened, or even regarded as mistaken—issues that also require consideration in how we approach and conceive of Learning for Sustainable Development in the moment and the longer term.

Going against the flow?

Work by Harré *et al*. (1999) on environmental discourse—called 'Greenspeak'—has been seminal in drawing attention to these issues and how the processes of specifying, learning about, and contesting concepts like *conservation*, *Gaia* and *interdependence* rely on a range of narrative themes and story forms, be it implicitly or explicitly. Their works illustrates how the significations and semiotics involved in the construction and circulation of such concepts in public, scholarly, and pedagogical discourses will often differ as much as they converge. By way of illustration, environmental discourses, narratives, motifs and metaphors in both conservationist (radical) and exploitationist (conservative) *Greenspeak* can configure the same concepts from biology, psychology or physics quite dissimilarly, with very divergent story arcs and ends in mind. This is achieved by drawing quite differently on popular, scientific or mythic analogies that are used to frame a problem or issue (e.g. regarding Gaia and the biosphere). Thus, we might find our environmental predicaments being portrayed as:

- We/ habitats/ ecosystems are bound for destruction unless we mend our ways (a catastrophe scenario), or
- We can address problematic activity by learning our way forward with better and tighter attunement between beliefs and behaviour (a reform scenario), or
- We can manage resources more efficiently and effectively by changing our institutions and practices (a modernisation scenario).

Further to this, while many now recognise environmental topics like global climate change as mainstream sustainability issues, Harré *et al*. raise the important question of how this comes to be so for this issue over other issues (culturally, sociologically and discursively), *and* over the attempts to make other issues just as equal and apparently 'media-friendly' and 'common sense', to the degree that, for example, they become subject matter for schools and the curriculum too. We believe Hajer's (1995) work on environmental discourses is of help here in terms of its focus on the emergence of discourse coalitions, particularly if we are to make sense of contemporary artifacts like a movie documentary on the topic of climate change like Davis Guggenheim's (2006) *An Inconvenient Truth* and the way it represents a combination of entertainment and education, amongst other things. For Hajer, the notion of a discourse coalition highlight the way in which a range of social actors attempts to blend together diverse—even antagonistic—perspectives for common and often *urgent* ends. Thus, a group of social actors, in the context of an identifiable set of practices, comes to share the usage of a particular set of story lines over a particular period of time in a particular way, which, in terms of the environment (as we have seen above) can take the form of a compelling rhetoric of imperative: *to avoid pollution, disaster, disease, or catastrophe*. Such a conflation of discourse fragments is evident throughout the examples in Hajer's work on environmental politics and ecological modernisation in European countries. But as in the film example, they also emerge in relation to global warming where the coalitions themselves include diverse voices from the likes

of Bono, Tony Blair, Kofi Annan and Al Gore, and in examples like the UK's *Stop Climate Chaos* campaign, where we see a coalition that contains most of the UK's leading environmental and international development organisations as well as women's organisations, activist groups and faith-based campaigns, seeking to work together under a common manifesto to catalyse 'a popular mandate for political action on climate change'.

What's the story?

"Essentially, … a plot requires a transformation. There must be an initial situation, a change involving some sort of reversal, and a resolution that marks the change as significant. Some theories emphasize types of parallelism that produce satisfactory plots, such as the move from one relationship between characters to its opposite, or from a fear or prediction to its realization or its inversion; from a problem to its solution, or from a false accusation or misrepresentation to its rectification. In each case we find the association of a development on the level of events with a transformation on the level of theme. A mere sequence of events does not make a story. There must be an end relating back to the beginning – according to some theorists, an end that indicates what has happened to the desire that led to the events the story narrates." Culler (1997, p.80)

The *Canadian Journal of Environmental Education* (2002), Volume 7(2), amply illustrates the variety of ways in which narrative themes and story forms are brought to bear in education-focused deliberations and processes regarding environment, places and sustainability. Vividly demonstrating this in this collection of papers, Edmund O'Sullivan, Professor in Transformational Learning at the Ontario Institute for Studies Education, states:

> *"… we are living at the end of a story. That is to say the end of a period of history that had great attractions to it, although it also had an underside that we are only beginning to feel. But it's the end of the industrial story. That was our own invention as humans, and it is only one way that we have been in the world. We have to remind ourselves that we have only been in that period called modern-industrialism a short time. But in that short period of time, we have had a devastating impact in terms of how we have invented ourselves.*
>
> *"… this technozoic story that we're living in is a terminal story, although it is glossed, in terms of advertising, as the direction we have to go. What is needed in that sense is a deep discernment, to be able to actually look through, and see through, that type of story. That is not a life-giving story and it is not an inspiring story.*
>
> *"… I think that sense of a journey is important in terms of our stories, as part of a story about the journey of our lives. And so, in that way, I appreciate the stories that are actually fighting for the sense of the differentiation of the creativity of the universe in which we live in, the ones that express the deep sense of subjectivity. That is to say, the different types of interiority, and also the expanse of stories of communion—differentiated communion is so important—to have that kind of discernment, to move away from the things that do not do that, and move toward those things that make life joyful and beautiful." O'Sullivan in Jickling* et al. *(2002, pp.286-287)*

The extract suggests to us a wide range of possibilities for inquiring into the narratives of Learning for Sustainable Development, prompting examinations of, for example:

- Notions of time (public, personal, historical …) and place in the world (ontologically speaking, symbolically, conceptually, spatially, mobility-wise, spiritually, etc); *Leitmotivs* that ascribe responsibility for present and future generations and other species, e.g. in terms of conservation, stewardship, development, participation, citizenship, greener or more just forms of capitalism or alternatives to it, and
- The tales that are told (e.g. realist, moral, sacred, technological, biographical) about people's interactions with their environments, the sustainability problems this may generate, and criteria for solutions or progress towards sustainable futures.

More pertinently, we would suggest issues and debates flowing from this for educators and education could pursue questions about: (i) who or what narrates the meanings of

sustainability, (ii) what is (or isn't) signified in sustainability narratives (e.g. in terms of nature, class, gender, race, disability, agency, power, structure, science, myth, worldview ...), and (iii) how sustainability narratives are constituted, layered, legitimated and circulated in educational settings, for example, in subjects, curricular documents, and 'classroom talk'.

Discussion

As highlighted by Harré, Hajer, Culler and O'Sullivan, stories may offer different and diverse means to similar—and/or alternative—ends. Theory, research and experience suggest we consider a story and its performance, but also the story in relation to its communication and reception, as well as its believability, dynamics, fragmentation, and remember-ability. We might also give attention to the ways in which sustainability stories offer vision, imagination, evocation, sense-making, re-storying, patterns, scenarios, back- or pre-stories. Then again, we might want to consider them in terms of their entertainment value, information, involvement, connection, clarification, consolation, resolution, persuasion, identity formation and development (e.g. sense of self, culture and nature), expectation, history, and social criticism. Or, for that matter, we might attend to what they demonstrate in terms of their pleasures, mastery, power, truth, control, authority, identifications, norms, aspirations, warnings, advice, and what may be (or is intended to be) inferred. Put another way, there is much to be explored here, particularly in terms of the empirical aspects of inquiries in this area with teachers and learners. On this latter point, we note that Paul Hart (2002, p.147) has argued:

> *"To act is to theorize, says Pagano (1991). I cannot describe my day or a moment in my classroom without recourse to intentions or assumptions. We act in ways that reflect our beliefs about the way the world works. Teachers' theories are stories about the kind of world we want to live in and about what we need to do (with children) to make that world. … My stories reveal my values and attitudes, my sense of my cares and responsibilities, whether as teacher or as researcher. To know ourselves then becomes a teacher's or a researcher's primary obligation. Education is meant to change people, as is research; not through colonizing their consciousness but by bringing them to a place where they can go on to make up their own stories (Pagano, 1991)."*

Asking, '*Are there not better ways to live lives sustainably* (culturally, economically, politically, environmentally …)?', might well be a key question in debate and progress in Learning for Sustainable Development, but as we have argued here, responses to it by educators and learners will often be enmeshed in a wide range of stories that constrain and enable both the colour and the shape, and the form and the content, of such narratives of sustainability (for example, tropes of salvation, health, well-being and redemption recur in many such stories emerging from Western or Judeo-Christian cultures). Indeed, regarding this, we would argue that there is good reason for educators to pay attention to the living out of sustainability and the attempts and failures to do in their work, because this is where the retellings of tales of the past (about its peoples, places and priorities) jostle alongside the narratives of new contexts and urgencies for the future. And it is here too that the dynamic and diverse 'friction of fictions' provides energy and inspiration for the working and reworking of contemporary discourses and concepts of sustainability, because the narrating of both ourselves and sustainability that they entail often involves a problematisation of both, when viewed from a historical perspective, just as much as it also opens up the possibility of alternative construals. Learning for Sustainable Development will thus not only be about engaging people with the detail and building blocks of things like the 'technozoic story', but also asking whether, if and how it should continue. Doing so, we find ourselves also invited to examine which and whose stories and narratives we favour, discredit, tell or silence through Learning for Sustainable Development, and in education and society more widely.

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13. Teaching of Natural Resource Management and Sustainable Development at the Intermediate level of Academic Course

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Abstract: Nepal is rich in natural resources, soil, water, and forests. Biodiversity of the country is so diverse due to different climatological conditions supported by the land orientation and topography. Due to the lack of an encompassing course in natural resource management a rapid depletion of natural resources is taking place. Besides, ignorance and low level of awareness about the values of natural resources has an influence in rapid depletion. Natural hazards are the main problems of Nepal. International and National organizations working for nature conservation have realized the issue and emphasized the education of the students in mid-level. Students can get necessary basic information on natural resource management so that they can conserve the natural resources. This in turn will help in sustainable use of natural resources for the future as a means of national development.

Inclusion of the course on Natural Resource Management and sustainable development in the curriculum of higher secondary level education is considered a positive step for biodiversity conservation.

Nepal is a country located in South East Asia. It lies between two big countries of Asia: India in East, South and West and China in the North. It covers an area of 147181 square kilometers of land. The total population projected for year 2006 is 25,767,919 (CBS, 2003, MOPE). Nepal is rich in natural resources and biodiversity. The Forest coverage of the country is 39.6 percent of the total land area. There is a large amount of water resources, capable of producing 84,000 mega watt of electricity. The soil is very much enriched with organic matters supported by climatic conditions in the middle land and low land of the country that three crops a year can be harvested.

Nepal initiated the incorporation of the Natural Resource Management (NRM) course at the school level (grade eight to twelve) since 1996 under the subject heading "environment and Population". This is a good indication that NRM and sustainable development is being taught to young students and thereby creating awareness about the importance of natural resources in daily life. The course includes all the available natural resources. Soil is a major component. It also includes land degradation, which is a common but serious problem for Nepal. It has resulted in low productivity due to wastage of fertile land thereby affecting the economic condition of the population. The physiographic land orientation of the country, the rugged mountain landscapes are factors for land degradation because of fragile geological and topography with excessive slope. The country starts at an elevation of 60 meters above sea level to 8848 meters above sea level within a span of 129 kilometers. Besides this, climatic and human pressures also contribute towards the acceleration of the land-degradation process.

Besides, natural resources like water, forest and land are declining either in supply or quality and hence unable to support the livelihood of the hill and mountain population in a sustainable manner.

In recent years, the government, non-governmental institutions and development organization have expressed serious concerns over the over-exploitation and poor management of land resources. Though significant contribution to improve the management through development of qualified human capital has been initiated for the sustenance of natural resources for future generation.

Till 1996 there was no such academic course offered to the school level students. The course "environment and population" carries a full mark of 100 points. The course puts emphasis on the land management and control of population growth. Land as the basic natural resource is very important because the biomass (vegetation and wildlife) is dependent on use by human population for shelter, food and everything for the commodity of livelihood.

Education on natural resource management is very important for Nepal, as land degradation is a major threat to economic and rural development. Nepal is a country where about 86% of the population lives in rural villages. The economy of the country is dependent on rural economy and it is closely linked with development.

Systematic information and adequate database are lacking in Nepal. So, it is difficult to draw a sound cause-effect relationship and so proper recommendation is often difficult to take proper action. Formulation of sound land management practices to address the land degradation has been difficult. Due to lack of strong emphasis on the curriculum, it has not reached effectively to the grass root level. The major reasons could be complexity of landscape and varied socio-economic setting, demanding a through understanding of complex and multiple farming system and their interactive roles.

The natural or environmental resource degradation covers land degradation, including loss of soil fertility, soil erosion, land slides, ground water depletion, watershed destruction, deforestation, felling of trees, over exploitation of graze lands, grass lands, fuel and fodder shortage (Jodha 1998). Land degradation is the permanent or temporary lowering of the natural productivity and potential of the natural products like soil, water, vegetation (FAO, 2000).

For the reconciliation, surveillance of overcoming of the decline of natural resources resulting in the improvement of quality of natural resources is due to processes induced mainly by human initiatives that could be done only by the proper education for creating awareness to stress wise utilization of natural resources (UNEP, 1992).

On the environmental education of natural resource and sustainable development, six forces are important, viz.:

a) Natural forces: calamities, disasters
b) Demographic pressures: rapid population growth
c) Livestock pressure: unproductive and local varieties
d) Development pressures: unbalanced and not eco-friendly development
e) Techniques and management practices: negligence of indigenous technology
f) Socio-economic pressure: ethnic and cultural practices

Education to the grass root level population is a cross cutting issue which implies on the forces directly or indirectly influence the natural resource management or mismanagement practices including forest resources in the mountains.

The forest resources degradation is influenced by deforestation, cultivation of marginal and non-arable land and inappropriate construction of the infrastructure (so called development, road, buildings, factories, dam, canal etc.) as the major human-induced factors of hazards in Nepal. These are the key factors that should be looked by Environmental Impact Assessment (EIA).

Degradation of Forest Resources

Forests are the source of fuel wood, fodder for livestock, control on soil erosion, land slide and soil quality maintenance. So, the quality (condition) and quantity (coverage) of the forest of nation is not only for natural environment but equity contribution on the socio-economic conditions directly or indirectly. Till 1965, the forest coverage of Nepal was 45.6 percent of total land area (HMG/USAID, 1965 as cited in FRISP 1998). Since then the forest coverage of the country is declining. LRMP stated that the forest coverage was 38 percent in 1986 and the decline was at a rate of 2.9 percent per year in 1999. The concept of forest conservation started in 1987 and due to these forest conservation programs the forest coverage is maintained at 39.6 percent DANIDA, 2003)

The total natural forest area of the country is estimated at 4.2 million hectare (i.e. 29 percent of land area) and the total area covered by shrubs is 1.5 million hectare (i.e. 10.6 percent of total land area) (DFSC, 1999).

The importance of natural resource management has been realized by the Government of Nepal (GON). It is also realized that people's participation is very important in this process. Actually evolution of the community forestry program is the result of people's participation in natural resource management. However, the participation cannot happen without basic education on the subject matter in school and college courses.

The primary advantage of natural resource management in schools and colleges are easiness to include in the curriculum, full participation and influence in the practices. Once the community is persuaded about the importance of natural resources, they will understand the role of managing natural resources for good results and beneficial impacts.

Department of Forest and Soil Conservation (DFSC) of Nepal has undertaken various activities including support in inclusion of the subject matter in the school level curriculum. DFSC has a good infrastructure: District Forest Officer (DFO) is based in the district. The Community Forest Users' Groups (CFUG) is the major stakeholder of the community forests. So the interplay of CFUG and DFO has resulted in involvement of both formal and non-formal education (NFE) system.

The forests of Nepal are conserved under different modalities:

Leasehold Forestry Program (LHF): Patches of the forested area is given to the poorest of the poor on familial basis for its management and wise utilization.

Community Forests (CF): A small community with households between 20 to 150 households is given a patch of land. The forest ownership lies with the government, but the users have the right to use the products of forests.

There are three other categories of forested land like Natural Forests, Religious forests and Private forests. However, these types of forests are not part of the education system. The community forests and Leasehold forests are the prime topics for educating the student. And theses issues are very relevant to the students.

Conclusion

Currently, management of natural resources is an important issue in the education system of Nepal. It gives opportunities for poverty reduction of poverty and helps in sustainable development. Conservation of natural resources, especially the forest is very important in the Nepalese context.

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14. Teacher Education and the Integration of a Sustainable Development Perspective

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Abstract: The paper leads to the question: What gives encouragement and motivation for learning outcomes that will lead to competence in a teacher's profession for ES in the long run? The presentation contents Focus and Specialisation in teacher education for Home and Consumer Studies and the starting points used in course planning in formulating purpose, goals, content and implementation. Examples are given of the opportunities and dilemmas identified in the teaching of various activities and concentrates on how Focus and Specialisation studies have been organised so that the student teachers are able to develop different qualities of subject competence, as well as integrating studies for sustainable development. To develop a teaching attitude in favour of sustainable development requires that the student tests different working methods, is confronted with complex questions, can deal with dilemmas, and create tasks and problems that they identify, analyse, and work out together.

Introduction

Some very interesting points have been raised in the invitation to the conference. They are well chosen and seem relevant to take up considering the challenges we are facing in implementing the teaching of sustainable development at all levels of the formal education system. The central theme of this paper is to describe how sustainable development has been integrated in the courses that merit 60-points for *Home and Consumer Studies* in teacher education at the University of Göteborg.

The paper commences by describing the considerations on which the teacher education is based, and the education organisation is briefly outlined. This is followed by a presentation of the *Focus* and *Specialisation* in the teacher education programme for *Home and Consumer Studies*, and the starting points used in course planning in formulating purpose, goals, content and implementation. Finally, examples are given of the opportunities and dilemmas identified in the teaching of various activities.

Studying to be a teacher at the University of Göteborg

The teacher education programme is an important component of the University of Göteborg, involving all its institutions. The study programme comprises a number of courses and offers specialisation, and also allows students to determine their own pace of study.

The study programme offers three different types of courses:

- *AUO*, which is *General Subject Courses*: three 20-point courses that the student teachers read jointly in mixed groups. The courses cover general teaching knowledge with subject theory and didactics as well as *VFU, Teaching Practice*
- Concentrated, 40-point, courses, called *Focus* with subject theory and didactics as well as *VFU*
- *Specialisation*, 20-point, courses with subject theory and didactics

The teacher education programme that was started in autumn 2001 is based on *"En förnyad lärar-utbildning*" (Prop. 1999/2000:135). A central point of departure in this is that the teacher is given new tasks. The teacher shall be able to guide the student in a teaching process that develops their ability to evaluate and criticise information and to assimilate this as knowledge. Theory and practice are combined and discussed during teacher training, based on the question of what knowledge is relevant to the teacher.

Focus and Specialisation in Home and Consumer Studies

This section concentrates on how *Focus* and *Specialisation* studies have been organised so that the student teachers are able to develop different qualities of subject competence, as well as integrating studies for sustainable development. In this sense, the teaching profession can be

said to be ”to teach others to learn to promote sustainable development”. On this premise, in my opinion, teacher education should be based on courses in which subject theory and didactics are integrated and the knowledge developed by the student teachers can be tested in a scholastic environment together with their pupils. The teacher training should be founded on a scientific basis and give potential teachers a way of working and an attitude to knowledge in which independent seeking and evaluation of information are fundamental.

Home and Consumer Studies is a part of Home Economics. The household is the unit of study. The activities of the household can be coupled to sustainable development. The household can be described as a unit in which people are interactive and interdependent in creating an inner environment and that is in turn dependent on the surrounding society’s material and immaterial resources. Within the household, evaluation is expressed through the actions of its members and strategies are developed to achieve goals and to meet needs. *Home and Consumer Studies* is a school subject that deals with the family and life in the home, which includes four areas of study: foods and meals, housing, consumer economics, and social relationships as well as an understanding of the value of this knowledge for individuals and nature. Planned use of resources is a dominant theme in Home Economics, and sustainable development is included in research and basic training. The course plan for *Home and Consumer Studies* in compulsory schooling (Skolverket 2000) states that four general areas shall be focussed on: health, culture, resource use and equality. The Curriculum for compulsory School, Lpo 94, (Utbildningsdepartementet 1998) states that an additional four areas shall be deep rooted in education; aesthetics, internationalism, history and the environment. These provide a good basis to establish an emphasis on sustainable development in ecological, financial, social and cultural dimensions.

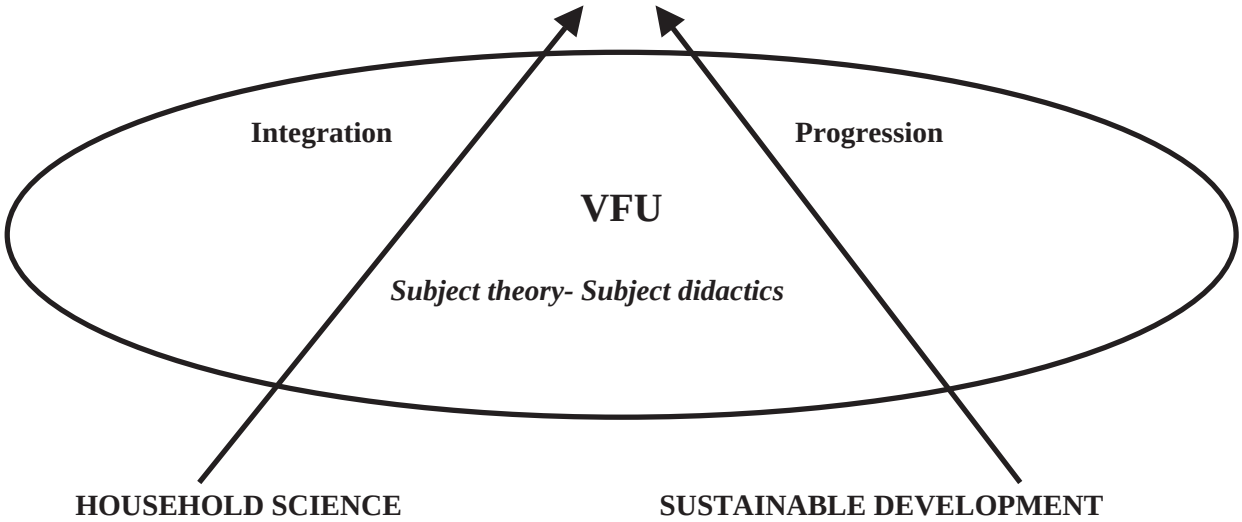

Figure 1. *The model shows the direction of Focus in Home and Consumer Studies and integration and progression of subject theory, subject didactics and VFU*

In the development of courses for the teacher education in *Home and Consumer Studies*, the central question has been ”What does a *Home and Consumer Studies* teacher need to be equipped with, in order to be able to apply sustainable development in the compulsory school system, in the long term?” The traditional view of a subject area is changing in favour of courses that integrate subject theory with subject didactics, with the object of enabling the student to develop an attitude to teaching sustainable development.

Home and Consumer Studies comprises four courses

LHK100 *Everyday family life*, 10-points including 2-points for VFU

LHK150 *Foods and Meals in a sustainable society*, including 2-points for VFU

LHK200 *Act for the future*, 10-points including 1-point for VFU

LHK250 *Living in a global context*, 10-points including 5-points for VFU

- LHK100 provides a basis for sustainable development in a household perspective and for dealing with topics in the school. Household studies, workshops and projects are included
- LHK150 goes deeper into foods and meals, including kitchen activities. The course concludes with a project
- LHK200 develops teaching for sustainable development in the areas of consumer economics, housing, life-style and social relationships
- LHK 250 has an international focus, and the course does this through looking at the household's attitudes to and interdependence with the world, with an emphasis on sustainable development. Study visits are linked to workshops, and individual in-depth studies are also included.

Specialisation courses in Home and Consumer studies

LHK300 *Health Education*: 10-points

LHK320 *Nutrition and health*: 5-points

LHK330 *Consumption and sustainable development*: 5-points

- LHK300 deals with sustainable food habits for healthy living, which is linked to the concept of sustainable consumption. Each student implements a project in a school to teach and guide the pupils as well as the teacher to develop good health habits. A typical project is to change what is offered in the school refreshments shop to products that meet ecological, economical and social criteria.
- In LHK320 the students examine the connections between nutrition and health. By identifying and analysing their own dietary habits the student can develop an understanding of the complex issues concerning food choice. A part of understanding sustainability is creating an environment for learning about nutrition in which school pupils participate, give inputs and accept responsibility to be able to choose foods according to their own needs.
- LHK330 is a new course given for the first time in the spring 2006. One aim of the course is for students to be able to analyse consumption choices in relation to sustainable development with the object of giving them a deeper understanding of consumer economics.

Opportunities and dilemmas in dealing with the subject of sustainable development in teaching

Household studies

The students carry out household surveys in the LHK100 course. The interactions between members of the household, society at large and the natural environment are dealt with from the household's perspective. The student chooses some household activities such as travel habits, energy use, food purchases and food habits. A household-scientific model is used to analyse the results and identify strategies that the household develops to achieve their goals and to meet their needs. The student uses the analysis to identify problems, describe and discuss them, and to make proposals for alternative solutions. The student is to keep in mind an emphasis on sustainable development.

Workshops

In order to develop subject knowledge and didactic competence, students formulate their own goals for the area of foods and meals in preparation for working with school pupils in *VFU* programmes. These can relate to methods of food preparation, handling foods in applying different quality aspects, or composition of meals. One example in LHK150 is a workshop in which the students prepare all the meals for one day for a particular person. The quality aspects that the students must bear in mind in presenting the meals are ecology, cost, energy use, and nutrition. Food marking, use of seasonal foods, transport, and imported *vis a vis* local

production are topics that are all dealt with in context. In a research study which discuss how energy efficient meals and diets can be composed (Carlsson-Kanyama, Pipping Ekström & Shanahan, 2003) students can find dilemmas in food trends and sustainable development. Computer-based studies can be included to develop information and communication technology (IKT) as teaching support. Menu-Tool, an interactive tool for sustainable food habits, can be used in creating and assessing meals. The students have had a prototype available that is to be tested in households and schools during spring 2006.

At the household level, a general conclusion from our research is that information in combination with feedback on how one's own everyday habits impact on the environment can be effective. These results have been reported to the scientific community but not used by society to a large extent – not an unusual situation! This led us to the project: *Developing an interactive tool for environmental menu planning, evaluating it and making recommendations for its further use*, in short: *Menu-Tool* (The Swedish research council for Environmental, Agricultural Sciences and Spatial Planning, 2004-2006). The goal of *Menu-Tool* is to increase the capacity for environmental menu planning among food service managers, interested members of the public, and school pupils. This will be done by developing an interactive digital instrument that can be used for environmentally sound menu planning. Information is life cycle based and quantified showing MJ per kg and greenhouse gas emission per kg (Carlsson-Kanyama et al 2003).

Projects

The purpose of projects is to enable students to go further with topics they find relevant and interesting. This means the opportunity to work together in posing didactic questions concerning family and consumer studies as a school subject, to follow a process, identify content and activities, and to follow up on and assess the work. It also means that the students can develop their creative competence. Within the framework for projects, the students can test different alternatives for dealing with sustainable consumption in the household activities. Each student can test their understanding by producing materials that could be used in a school situation in applying teaching forms based on different ideas, which gives an opportunity to try action research methods.

One student group that chose to work on understanding sustainable development in a household situation used role-playing in which family members tackled creation of a formal meal together. This was tested in different groups in schools and teaching situations, and an English version was created as well as the Swedish one. During 2005, Helene Wåhlander together with a student, Anna Freij, produced teaching material on assignment from WWF, *Mat på hållbar väg*, (WWF 2005) which includes role-playing. This has been assessed in different teaching situations with very positive results. There are some factors that are very important as the teacher and the pupils perceived the role-playing as a success. It is useful with pupils of different ages and in different teaching situations. It can be used as an inspiration to lead to more in-depth studies on sustainable consumption. It encourages cooperation with different teachers. The information and instructions used are easy to set up and can be reused many times. The pupils play different roles and are given the opportunity to test how it feels to reason a case based on another person's assessment. This promotes post discussion on attitudes and bases for behaviour and choice.

Another example is a game about ecological footprints that was produced by three students in the *Food and meals in a sustainable society* course, in spring 2005. During the course *Living in a global context*, the students decided to build on the game, testing it with a group of pupils during their VFU time, and the opinions of the pupils led to changes in it. The students will develop the game further, including writing teacher instructions for it. The game will probably be published during 2006.

The connection with the compulsory school organisation

Stefan Edman (SOU 2004:119; SOU 2005:51) appeals to consumers and the Swedish Government, in stating one of his fundamental recommendations:

"Recharge home economics education – interdisciplinary learning about global survival questions with focus on food and meals, social relations, housing and consumer perspective. Make the subject obligatory throughout the compulsory school system!"

We buy this recommendation without hesitation. But to create effective educational programmes we need to build on experiences of new teaching approaches and results from relevant research. We need to keep in mind that information and delivering of knowledge is only a small part of the complex process of changing behaviours and establishing sustainable everyday habits, but nevertheless important.

Opportunities and dilemmas for discussion

One topic, in particular, that I find important to discuss is how to establish international co-operation for teaching sustainable development, how to deal with the ethical dilemmas regarding material and immaterial resources, and how to give students actual tools for action to reinforce their awareness and confidence and support them in acting from a sustainable standpoint.

To develop a teaching attitude in favour of sustainable development requires that the student tests different working methods, is confronted with complex questions, can deal with dilemmas, and create tasks and problems that they identify, analyse, and work out together. In project work, students often find that the problems they are tackling are best solved by co-operation between different "subjects" in the school, leading to general theme work. By demanding choices and views and the ability to back these with arguments trains their ability to deal with the didactic questions *what*, *how* and *why*. Work assignments are framed so that the students can orientate themselves to the great flow of information and train their ability to question sources.

In conclusion, a complex question: *What gives encouragement and motivation for learning outcomes that will lead to competence in a teacher's profession for ESD in the long run?*

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15. The Role of Integration of Non-formal and Formal Education for Sustainable Development in All Levels

Olga Madison, Eco-schools/Green Flag programme and NGO "Keep St.-Petersburg Tidy", St.-Petersburg, Russia

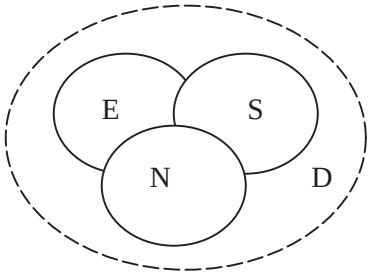
Abstract: Education for Sustainable Development (ESD) covers social, economic and environmental aspects. The nature of learning/teaching environment is also an integral part of ESD. It's important to give students certain knowledge and skills. However, it's equally important to give them the ability for conscious decision-making and to show the value of democratic approach.

Formal education in Russia giving knowledge and skills in various subjects is still rather authoritarian in its process. At the same time non-formal education run in Russia mainly by after-school activity centres and non-governmental organisations (NGOs) has more freedom in choosing the methods and ways of teaching and learning. Besides, it's easier for non-formal education institutions to use interdisciplinary and participatory approaches. One of the examples of integration of non-formal and formal education is expeditions and environmental camps arranged for children and youth of all aged during vacations. They are usually run by the institutions of non-formal education and involve school and university teachers as well as researchers as supervisors. Often university students act as group leaders for children.

Another example is the international programme Eco-schools/Green Flag run by NGOs for and with kindergartens and schools. Even universities in Russia show some interest for participation. The implementation of the programme facilitates interdisciplinary and participatory approaches, project work and both local and global dimensions in education in all three aspects of SD. So, the experience of the NGO "Keep St.-Petersburg Tidy" shows that integration of non-formal and formal education is not only possible, but absolutely necessary as well.

Introduction

It is known that Education for Sustainable Development covers education in social (S), economic (E) and environmental (N) fields in their interrelationship. We should take into account that integral part and necessary background for implementation of Education for Sustainable Development is learning and teaching based on democracy (D) and understanding.



However, nowadays the educational authorities and the majority of educators in Russia consider Education for Sustainable Development (ESD) to be just another title for environmental education (EE). One of the reasons of that approach, to my mind is that socio-economic aspects are more difficult to deal with in majority of the subject. Unfortunately, there is still no clear national strategy in Russia for ESD implementation through formal education. But there are a lot of local initiatives related to ESD. As to ESD-competence special research should be made to evaluate it.

ESD challenge for formal education in Russia

Introduction of Education for Sustainable Development to formal education brings new opportunities, such as interdisciplinary and cross-sectoral approaches, enriching the subject contents, etc. It brings additional problems as well the main of which is that teachers themselves don’t have enough knowledge in ESD and should improve their qualification. That is why the

drivers for ESD implementation will be (1) inclusion of fundamentals of sustainable development in teacher training and improving qualification programmes and (2) introduction of teachers and school authorities to the teaching and learning methods based on interdisciplinary and cross-sectoral approaches as well as programme oriented and project-based teaching and learning.

As it was mentioned learning and teaching environment itself is an integral part of ESD. It is no doubt that students should get certain knowledge and skills while studying. However, they should also get competences in conscious decision-making and feel the value of democratic approach. The barrier for ESD implementation at schools is that due to the educational process in Russia the students are motivated to pass graduation and entrance exams successfully rather than to develop their competences. Implementation of the Unified State Examinations in various school subjects made that barrier even more difficult to overcome.

Formal education in Russia giving knowledge and skills in different subjects is still rather authoritarian in its process from the viewpoint of teaching methods and decision-making system. At the same time, the knowledge and skills gained by a person usually has nothing in common with his/her competences development. That is to be improved in the Russian formal education. However, that gap is to a large extent filled in with the non-formal education system.

ESD in non-formal education in Russia

Non-formal education in Russia which is conducted mainly by after-school activity centres and non-governmental organisations (NGOs) gives more freedom in choosing the methods and ways of teaching and learning. For example, trainings and seminars are traditionally based on active participation and referring to personal experience of the trainees. That is why co-operation between pre-schools and schools on one hand and after-school activity centres and NGOs on the other hand through different projects and programs gives extra flexibility. It also improves cross-subjects links, and involves students in decision-making processes, including in school management. Besides, non-formal education uses widely outdoors education, camps and expeditions as learning and teaching environment. Highly qualified experts from leading universities, research centres, museums, etc. usually work as teachers, trainers or supervisors during such kind of activities.

Integration of non-formal and formal ESD

The experience of "Keep St.-Petersburg Tidy" NGO that I represent shows that integration of non-formal and formal education is not only possible, but absolutely necessary as well.

Expeditions and camps

One of the examples of that integration is arranging expeditions and camps for children and youth of all ages during school and university vacations. They are usually run by the institutions of non-formal education and involve school and university teachers and researchers as well as university graduates for supervising the research made by children and young participants. The expeditions and camps always have practical outcomes reached through less lecturing and more watching, trying and playing than in formal education. Young participants take part in real investigations, experiments and research. Quite often they get certificates that give them extra points at the entrance examinations they have to pass to enter universities. The results of the students' works are usually summarised later at their schools together with the teachers and presented afterwards at various seminars, conferences, contests and Olympiads on behalf of the schools they study at.

It is very important that during the expeditions young participants not only improve their knowledge in various subjects but also learn to behave in Nature, to communicate with group mates and adults, to find their place in the social community. They also get very basic skills of setting up the tents, making a fire, cooking, cleaning, taking care of the others, etc. Young participants pass the real school of life and contribute to practical activities leading to sustainable development. Widening the system of camps and expeditions, holding international ones could be the driver of ESD.

Why can we call the camps and expeditions non-formal education for sustainable development?

Such events give education as the participants gain new knowledge and skills related to the school subjects. The majority of practical work carried on there is Nature/Environment oriented, i.e. the participants investigate the surroundings, take samples, count the number of species in certain areas, watch birds, look for historical sites and natural and archaeological monuments.

The social aspect is also very clear there as the participants stay for 1-3 weeks in rather closed social environment and should learn the basic rules of co-existence and, sometimes, conflict resolution. In some expeditions with historical background the participants meet local people and learn about the habits, customs and traditions of local population nowadays and in the past. There is also evident economic aspect as not only adults, but also younger participants are responsible for the budget planning during the camp or expedition.

Children and young people can choose the group they are working with, the topic of their personal part of investigation or research, as well as the field of study. It helps them develop their responsibility for their choice having been made. As to the decision-making process it is for sure based on democracy and participation. All the decisions are made at the common gathering of all the participants and staff of the camp or expedition. All household activities are shared between the participants and the staff, for example, bringing firewood, cooking, cleaning, etc. Usually schoolteachers also take part in such camps and expeditions together with their students, but the teachers' role there is changed to that of trainers or supervisors.

During the outdoors events run in the camps and expeditions, intellectual activities are combined with physical ones. Such approach gives a chance for those children and young people who have poor academic records at school than their classmates but are stronger, quicker, better physically trained to get their points and be more respected by the others.

So, despite the fact that the majority of camps and expeditions held in St.-Petersburg and neighbouring regions are called environmental they are good examples of integration of formal and non-formal education for sustainable development

To get a general impression of what the expedition or camp is about you can visit the website[1] of the Environmental, Tourist and Health Improving Camp "Nadezhda-2006" held in the Nature park "Vepsski Forest" on the bank of one of the unique lakes of the Leningrad Region Dolgozero in 4-5 hours drive from St.-Petersburg. The website is in Russian but it has a converter into several languages. If you click onto the pictures on the right hand side and onto the list places onto the left hand side you will see the photos and know more about that kind of non-formal education outdoors.

Eco-schools/Green Flag international programme

Another example of successful co-operation between formal and non-formal education is the programme Eco-schools/Green Flag[2] run by national NGOs for and with kindergartens and schools. It is one of five international programmes of the Foundation for Environmental Education (FEE). More than 14000 schools from 37 countries of the world take part in it. The programme has unified rules and criteria obligatory for all participants, but, of course, each country can add national criteria and ideas for the programme implementation. For example, in Russia 100 percent of the students should be able to participate in the school activities; in addition each school should have either a Letter of Support or the Co-operation Agreement with the local authorities confirming their involvement.

The programme is implemented in the following steps:

1. Forming the Eco-Council consisting of the representatives of the students, teachers, administration, technical and supporting staff, parents and local authorities;
2. Investigation of environmental situation inside and outside the school;

[1] the website of the Environmental, Tourist and Health Improving Camp "Nadezhda-2006": http:/nadezhda.tikhvin.spb.ru
[2] the website of Eco-schools/Green Flag international programme: www.eco-schools.org

3. Action plan development for improving quality of environment;
4. Monitoring and evaluation;
5. Greening the school curriculum;
6. Informing and involving;
7. Eco-Code formulation.

Russia joined the programme in 2002 when the "Keep St.-Petersburg Tidy" NGO became a member of the FEE. Not only schools, but also kindergartens and after-school activity centres participate in the Eco-Schools/Green Flag programme in Russia now. Even universities in Russia show some interest for participation in it. So, we can say, that we have involved representatives of almost the whole range of educational institutions. We are still missing only colleges and vacation schools.

For better management of the programme we have developed in Russia the system of local information and methodological centres arranged at the educational establishments having been awarded with the Green Flag and showing extraordinary results in involving different stakeholders and sharing experience. The centres so far are non-formal structures run on the voluntary bases. They initiate and arrange events themselves or in co-operation with "Keep St.-Petersburg Tidy" NGO. The NGO representatives make presentations on request, provide the centres with the information materials and help with establishing contacts and inviting people.

The implementation of the programme at any educational establishment facilitates the process of using interdisciplinary and participatory approaches, project work and both local and global dimensions in education in all three aspects of SD.

Why can we call Eco-schools/Green Flag programme non-formal education for sustainable development?

The school activities in the programme are usually based on environmental projects. For example, investigation of nature in the school yard or nearest green area, sampling in local water body, learning about renewable and non-renewable energy sources, combating littering, etc.

Every school always includes in the action plan interviewing the parents, families and/or local people. Sometimes students visit institutions and offices situated not far from school. The results of school projects are presents at least to all the parents and sometimes even to local authorities. Schools communicate with other programme participants in their cities, regions, countries and abroad. One of the indicators is relevance of the school project to the need of the local community.

Through the projects the schools save water and energy, i.e. save money. Every other school collects waste materials and either reuses them or sells, mainly paper, to the recycling centres earning some money. The most important fact is that the students bring the finding of the school projects home and change the behaviour of their parents and even grand parents. Students report that environmentally friendly behaviour of the whole family very quickly results in considerable improvement of the family budget. There are several examples of schools becoming more active in fundraising and getting financial support for implementing their ideas and projects for improving local communities.

Eco-council gives students a chance to participate in the decision-making process, give some training in presenting their viewpoints, discussions with classmates and adults. Teachers, parents and other grown-ups get trained in being more flexible, tolerant and able to listen to children as well as each other. Schools, especially pre-schools, very often arrange various events and actions requiring joint efforts of the whole family and sometimes leadership skills of a child. It helps students become more active citizens enables decision-making and taking responsibility for their actions.

Conclusion

Hence the experience of the "Keep St.-Petersburg Tidy" NGO and its partner educational establishments and NGOs shows that integration of non-formal and formal education is not only possible, but absolutely necessary as well.

Non-formal education acts as the source of information and materials, media for sharing ideas and experience, ways of improving teachers qualification through study visits, trainings and seminars, facilitator for awareness rising and provider of co-operation with different stakeholders as well as promoter of outdoors education.

Formal education improves and develops the ideas, adopts information and materials to school system, transfers knowledge and skills to students, their parents and further to the local community, develops own ideas and methods based on democracy and interdisciplinary approach as well as strengthening co-operation locally, nationally and internationally. As the result students become more competent and aware of the needs of local community. It is important for their personal development, leadership abilities, capacity building and improving communication skills.

Integration of non-formal and formal education contributes not only to ESD, but also to further sustainable development itself.

16. Implementing ESD - Means, Drivers and Barriers

Martin Westin, National Agency for School Improvement, Stockholm, Sweden

Abstract: I have been working with ESD on national level in Sweden since 2003. At the National Agency for School Improvement I have been responsible for the ESD support given to pre-schools, compulsory schools, upper secondary schools and municipal education for adults. To write support material, arrange seminars and workshops and have dialogue with teacher and school leaders has been among my tasks. In 2004 I was the secretary for the Swedish national committee on ESD. The mission was to review and analyse how education systems at all levels work to promote development that is economically, socially and environmentally sustainable. The assignment included the organisation of an international meeting on education for sustainable development. It also included submitting proposals to stimulate the spreading of ideas connected with sustainable development throughout the education system. In this paper I will draw on the experiences of implementation at national level.

The paper will focus on implementation of ESD within formal education. I will describe different means for implementation and discuss drivers and barriers. The views and opinions that I express in this paper are my own. This paper does not express the official position of the National Agency for School Improvement.

The Swedish school system

The Swedish school system is a goal-based system with a high degree of local responsibility. The main responsibility for education activities lies with the municipalities and authorities responsible for independent schools.

The curriculum, national objectives and guidelines for the public education system are laid down by the Swedish Parliament and the Government. Within the objectives and framework established by the Government and the Parliament, the individual municipality may determine how its schools are to be run.

In other words, my experience concerns implementation within a decentralized school system. Some of the mechanisms described are only relevant to decentralized systems while others are applicable also to centralized systems.

Means of implementation

In this section I will review different means of implementation in the Swedish system. I will go through each of them describing them and make an assessment of their support for ESD.

Policy documents

The policy documents should govern what the children/pupils/students (further on “the pupils”) should learn and what rights and obligations they have in the school system. The most important policy documents in Sweden are:

- The Education Act;
- Curriculum for the Preschool (Lpfö 98);
- Curriculum for the Compulsory School System, the Preschool Class and the Leisure-time Centre (Lpo 94);
- Curriculum for the Non-compulsory School System (Lpf 94);
- Course syllabi for compulsory school and upper secondary school;
- Program goals for upper secondary school.

In Sweden there is legislative support for SD. For example the Instrument of Government (which is one of the fundamental laws in Sweden) stipulates “The public administration should support a sustainable development that leads to sound environment for the present generation and future generations”. The concept of ESD is not yet implemented in all the policy documents

for the school sector. But the national curricula deals with ESD. For example the Curricula for the Non-compulsory school stipulate that:

> *The environmental perspective gives students the opportunity to take responsibility for the environment they interact with directly and gives them a personal involvement in general and global environmental issues. The teaching underlines the duties of society and the ways in which our way of life can be adapted to create sustainable development. (Lpo - 94)*

Sustainable development is also addressed in the subject syllabuses. For example the syllabus for civics in compulsory school states that schools should aim to ensure that the pupils:

> *– acquire knowledge to be able to discuss local and global issues, which are important for a sustainable society,*

Several of the other subject syllabuses include goals concerning ESD.

Although the policy documents give support for ESD there is still a lack of clear signals of the importance of ESD in the key documents. Sustainability is still described mostly from a natural science perspective. The cross disciplinary approach that has evolved the last decade is not yet implemented. Furthermore, the policy documents encompass over 500 different goals. That means that the governing force of each goal often is assessed as weak. With so many goals a lot of room is left for the single teacher to make (random) priorities. In a classroom situation it is very difficult for a teacher to take into account all the different political priorities that are stressed in the goals in the curricula and syllabuses.

Teacher training

The Universities in Sweden are responsible for teacher training. Teacher training is one of the most important ways to influence the school system since it reaches all the teachers of tomorrow. The main policy document governing the teacher training is the Government bill on teacher training. In the bill ESD is put forward as one of the issues that teacher training should deal with. In Sweden, universities are free to choose priorities and direction of the teacher training within the frames that are stated in the bill. That has led to variations in how the universities choose to handle the teacher training. In some, teacher training in ESD is obligatory, while in others ESD is a voluntary option.

The training program for school heads

The training program for school heads is a responsibility for the National Agency for School Improvement. It is grounded in the state's responsibility to provide education of equal value in which school heads guarantee equality, legal security and quality in the decentralised school system. School heads are one of the most important actors within the school system. The school heads should be the pedagogical leaders and are therefore key players in giving possibilities to implement ESD.

ESD is not a part of the policy documents for the training of school heads. But it is implicit in the instructions since the program is stipulated to give school heads knowledge and capability to lead their schools in accordance with the national policy documents (where support for ESD is stipulated). But I think it’s fair to say that the support for ESD in the training program for school heads is weak.

The resource distribution systems

The funding of the formal school system in Sweden is a shared responsibility between the municipalities and the state. The municipal taxes finance most of the education but the state contributes with a state allowance which is given to the municipalities. The resource distribution systems vary among municipalities. But the systems have in common that they are, to a great extent, based on criteria such as number of pupils, type of pupils (socioeconomic background) etcetera.

From my point of view, the resource distribution is often based on short periods of time. The normal cycle stretches over one year. My guess is that this is not beneficiary to long term

perspective as ESD. Moreover it would be interesting to consider how quality enhancement can be more clearly linked to the distribution of resources and which combinations of qualitative and quantitative criteria best support ESD.

Assessment

In the Swedish goal-based governing system assessment at all levels plays an important role. At school level there is assessment of the pupils learning in various ways. In pre-school and in the earlier years of school there are other assessment tools than grades (i.e. portfolio, informal feedback, tests). From year eight in compulsory school the pupils are graded.

The teachers participate in assessment via the system for quality reports. They should, as a part of their daily work, assess how their teaching methods support the pupils learning. They should also make adjustments in pedagogical methods if needed. Furthermore they should participate in collective assessments together in work units. Each year every school makes a quality report, which should consist of an assessment of the results and measures for development.

The municipality puts together the quality reports from their schools and delivers a quality report to the state. This report should consist of an assessment of the results and measures for development.

The state inspects each school in Sweden every sixth year. The inspectors make assessment on the quality and judge if the schools follow the regulation.

Assessment of educational results and processes are very difficult. The goals for education are not easily measured. Especially the goals for ESD are very difficult to measure. Elaborated and time consuming methods are needed to find out whether students develop the necessary knowledge and values to act for a sustainable development. The methods and focus of the assessment influence focus and priorities within the school system. In Sweden assessment of ESD is still not made to any great extent.

In-service training

In-service training is a responsibility for the municipalities in Sweden. The municipalities are responsible for making sure that the pedagogical personnel evolve the competence that is needed to support the pupils development towards the educational goals.

In my view the municipalities have not been very active in creating opportunities for in-service training within the field of ESD. The priorities are often on basic skills for example support to mathematics, reading and writing. The in-service training on ESD is fragmented and is in many ways dependent on NGO's, National agencies and other parts of the municipal administration.

I. Drivers

In this part I will discuss drivers and barriers for ESD in a Swedish context.

Support from the government

The Swedish government with the Prime Minister Göran Persson made sustainable development (SD) one of its top priority's in the last decade. This has resulted in various political schemes to implement SD. One of the latest is the creation of the Ministry of Sustainable development (former Ministry of Environment together with parts of the Ministry of industry). These signals from the government have created momentum for engaged people on different levels of the Swedish society. Some of this momentum has been spread to the national and local levels of the school sector.

Bottom-up movements

The development of environmental education (EE) and ESD has been driven by engaged teachers to a great extent. These teachers have, in spite of a lack of clear and strong support

from the governing levels of the system, created momentum and helped to raise the perspective of environment and sustainability.

International momentum

The field of EE and ESD has been developed in Sweden in close connection to on going international processes. Interaction with processes such as the Stockholm conference in 1972, the Rio summit in 1992 and the Johannesburg summit in 2002 have been very important. Now momentum is building up in connection to the UN decade on ESD.

II. Barriers

Traditions and structures

The school sector has strong traditions and the structures are in many ways difficult to change. The scientific disciplines that have been evolving the last couple of centuries are dominant and have made strong marks within the school system. Education is still organised in subjects. Often the teachers and other actors identify themselves with a subject and this sometimes causes rivalry and creates obstacles for implementing cross curricula perspectives such as ESD. The traditions and structures also create barriers on the national level. Since the civil servants protect their areas of interest.

Fragmented public administration

The Swedish administrative structure is specialised. The administration is organised in small parts. The policy areas often compete for resources. This creates barriers between them and rivalry is common. Since SD is still viewed as part of the environmental policy the actors within the school sector are reluctant to accept the concept of ESD.

Weak pressure groups

The educational policy is formulated in interaction with different interests. There are strong pressure groups that look after different parts of the school sector. ESD has still not come into the scientific world and does not have strong support from the industry. This means there are no strong pressure groups that look after the interests of ESD.

Difficulties to assess ESD

There is a constant pressure on the school sector to show results. ESD is not easy to assess and measure. Therefore parts of the educational system that are easier to measure are often prioritised.

In conclusion, Sweden has made lots of progress in the field of ESD over the last decade. But there is still a lot to be done. There is a need to use the full potential in each of the means for implementation. Further more the implementation should be co-ordinated so that the different means support each other. For example clearer signals on ESD in the policy documents should be supported by a reinforcement of ESD in the training programme for school heads, for teacher training and through in-service training.

17. Education for Sustainable Development – Dealing with Micro Level Conflicts Between Teachers and Students

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Abstract: In India, students' performance in the higher secondary school examination is a benchmark for higher education. If the Indian society is roughly divided into upper, higher middle and the lower middle classes - whose children can think of higher education, the situation of students hailing from the lower middle class who have a low performance (<50%) in the higher secondary examination is critical. Even if they secure admission for some career-oriented course, their success in this depends on the motivation, appreciation they receive and the positive environment they experience during the course, which is not always possible. This is a very crucial phase for such students as their future depends entirely on their progress in this course.

An experience of why some such promises turn out to be hollow puts the spotlight on some micro level problems like

- Teacher student relationship
- Communication gap between teachers and students
- Character building through education for securing the future of such students
- A teacher's ability to go beyond subject teaching

These four criteria could be simply put down as 'ethical teaching by a capable teacher'. One such case study is a giving experience of working with students from the lower socio-economic class who performed unfavorably during their higher secondary examination and secured admission for a year long course in hardware engineering at a private institution. It was an experience of how communication gap between teachers and students created a barrier in education and how it was overcome with the help of a third person. Values like love, trust, honesty, responsibility, goal setting, personal integrity, hard work and consistent efforts surfaced during this training and helped in developing action competence, self-confidence, a proactive attitude and a fearless demeanor. Challenges like incompetence, rejection, self-denial, victimization, fear of failure and neglect were overcome. It also helped in creating a vision for the future and enabled the students to work their way towards successful completion of the course in hardware engineering and to secure jobs in the same field. All this was achieved in a short span of two months with an opportunity to interact with the students every alternate day for two hours.

Introduction

Education for sustainable development always raises issues related to the development of a country and as a developing country India too has it's own battles to fight. Providing employment to the huge population is one of the most crucial problems in the country. This problem gains prominence when it comes to the question of the huge number of students who have not had a very 'profitable' schooling. Profitable here means that these students are out of academic competition at the end of their higher secondary school, which is a benchmark for continuing with higher education in India. The problem is graver when questions related to low performing students hailing from the low socio-economic class surface. The Indian government and many private institutions offer vocational courses that equip such students with formal training and enable them to seek jobs in a variety of fields. The competence demonstrated by Indians in the field of computers has opened up an avenue in the service industry.

Participants in this case study

This case study deals with forty students at a private institution taking a yearlong course in computer maintenance popularly known as 'hardware engineering'. All students were expected to go through a course in personality development as a part of the hardware-engineering course. All students hailed from the lower socio-economic class.

The institution approached an organization, Quality Synergy Management Consultancy Services for HRD Assignments. A lady was deputed by Quality Synergy to undertake designing of personality development program and give inputs by conducting training needs assessment by first identifying their job performance related difficulties and barriers.

The lady (the author herself) deputed had not received any formal training in education, but had training in communication skills and interpersonal interaction, was self-taught and nurtured a genuine compassion for students.

Responsibility given to the Teacher

The lady deputed was to give priority inputs to help eliminate individual attitudinal and behavioural inefficiencies, body language and change their individualistic and self-centered job focus to interdependence and teamwork. For achieving the above-mentioned priorities correcting and enhancing communication skills and teaching the art of conversing in English was of prime importance. This had to be supplemented with ethics of dressing.

The forty students were split into two groups of twenty each. The lady was supposed to visit the institution every alternate day of the week and spend two hours with the students, except on Sundays. She had the liberty to decide whether to spend one hour with each group or two hours with one group, during each visit. This put together was 28 hours per group.

The Conflict Unfolds

Day one: From among the expected twenty from the first batch only twelve-thirteen students were present. The students demonstrated a reluctance to participate in this course, though clear instructions were given that the course in personality development is compulsory. This was obvious through their body language and from the number of absentees. The first lesson began with understanding what communication means and continued for two hours.

Day two: This session was meant for students belonging to the second group, but students present were a mixture of both groups - some from the second group and those from the first group who had not participated in the earlier session. The total number of students present was over twenty. The session on understanding what communication means was repeated.

Day three: All forty students were squeezed into the classroom. The classroom allotted to us was small and could not accommodate forty students. Students, who could not find a place, were sitting on the floor in front of the chairs and also along both the walls of the classroom. This roused the teacher's curiosity and she sought an answer to the overwhelming response. The teacher began communicating with the students and the following things were revealed:

1. They had paid a phenomenal sum to secure admission to this course, which put a financial stress on their parents.
2. The term 'hardware engineering' had misled parents into believing that what their children were studying was something just shy of a bachelor's course in engineering. As a result their expectations from their children were much greater than what the students would be able to fulfill in the long run. This put a good amount of stress on the students in turn.
3. The scenario at the institution was disappointing in contrast with the parents jubilation at getting an opportunity to enroll their children into an 'engineering' course (in spite of their low performance in the higher secondary school examination).
4. The students stamped as low performing students, were rendered unworthy of attention, love and respect by their teachers at the institution. This resulted in a wide gap in communication between teachers and students
5. Students were not motivated to attend regular classes on account of which further negative impressions or views about them were nurtured among teachers. This led to further decline in the regular attendance of students both during lectures and practical sessions.

This information was revealed in bits and pieces. The students lagged behind in the curriculum and their comprehension of the subject was questionable. Their reluctance in taking efforts, in participating wholeheartedly and lack of confidence to face any teacher from the

institution was obvious. The franchisers of this institution were young and this was one of the first few batches in hardware engineering from that institution. The institution's reputation was at stake too, but the franchisers did not know how to handle the situation.

This information made the lady teacher realize that the responsibility that had come her way was much beyond what was anticipated. She was now left with the choice of either continuing with her work along with shouldering this responsibility or giving it up entirely. This called for an open dialogue with the students.

Day four: After giving an opportunity to the students to vent their grievances, the teacher began talking to them. Firstly, she made them realize that low performance in the higher secondary school does not indicate a want of intellect. Having expressed this opinion, the students demonstrated some readiness to listen to what she had to say. She also told them that their analysis of the present situation reflected that they possessed good analytical ability as well. She probed them for the efforts they had put in to resolve the problem. The answer was negative. She asked them whether they wanted the situation to change, towards which everyone gave a positive response. She then asked them who among them would take the initiative to bring in the required change. Having received no response to this, she asked them several questions related to 'change' and found out that none of them realized that a change begins with self. She realized that the students lacked in one fundamental characteristic, which was a desire to do something on their own. Having shared this with them, it gave them something to think about before they returned for the next session. The students had never before gone through an exercise of self-realization, reflection and analysis.

Day five: On this day she put the students through the task of a complete analysis of their study habits. This analysis was put on the board in the form of a chart. At this the uneasiness among students grew. The reason they gave was that the classroom walls were of glass and the whiteboard could be directly seen from the franchisers office. At this she gave them the confidence that the franchisers had already noticed the students' attitude. If anyone had not realized what was happening it was they. This gave them something to think about.

Day six: This was a day for brainstorming on how the situation could be transformed completely. After a hearty discussion, the students agreed to the following:

1. That they will arrive punctually at the institution.
2. That they will not falter in attending any lecture or practical session
3. That they will be patient with their teachers and talk to them about the difficulties they had
4. That they will give 100 percent of their efforts to completing the course successfully
5. They will take regular efforts in understanding and doing everything related to hardware engineering and personality development that was taught at the institution
6. They will do the necessary reference work and will not rely on their friends for completing assignments
7. That they will assure of improving their conduct and shoulder their responsibility entirely.

If they had any problems they were free to share them with this teacher and seek her guidance whenever they needed it.

These strong resolutions gave them immense motivation and created the right spirit for hard work. Now every student was conscious of his actions, activity, his thoughts and everyone nurtured a feeling of belonging to this institution, which they had not experienced hitherto. They now felt hopeful of completing the course successfully. All forty students continued attending the personality development classes together, squeezed into that tiny room. It took another fifteen days to assess this transformation.

The franchisers then called the lady teacher into their cabin and asked what 'punishments' she had given to the students that all forty of them had turned over a new leaf. All were attending classes regularly, were punctual and also making a substantial effort, which was not seen earlier. They also told her that during her classes, they could see the students in rapt attention and that they obeyed her like kids. She took this opportunity to tell them that the

students were really good and that a teacher plays an undeniable role in education and facilitating this was their responsibility. At this, they pointed out that the teachers appointed at the institution had good academic records. She asked them whether they had asked the teachers why they had chosen this profession instead of an industrial position? They failed to answer this question.

A month later: The faculty asked whether they could attend her sessions. This was indeed surprising. Not to disappoint them she suggested that they take the franchisers permission. The franchisers in turn spoke to the lady teacher. To this she replied that instead of twenty she already had forty students and that the task given to her was half way through. If the teachers were to join, it would require some repetition of her work. Within the allotted time, it was impossible. But she promised to invite the teachers for at least one lecture.

Meanwhile the students steadily progressed. The lady teacher was after the students to help her fulfill her responsibility. Though they lagged behind schedule, everyone was motivated to stand up to the challenges of completing it within the stipulated time.

One and half months later: Thus was the status of students -

1. They were opening up, learning and taking sincere efforts to improve
2. Communication in the vernacular language had improved considerably, but conversation in English was very weak. Spending two entire months on improving it would not have improved it to the expected level. It required a lot of extra effort and time.
3. Body language improved considerably. They quickly learnt the mannerisms expected to be practiced in a work-environment and made considerable progress.
4. Difference between formal and informal clothing was told and the ethics of dressing were shared with them. But this was not an area where one could expect an outcome. Belonging to the lower socio-economic rung of the society did have its limitation, which were respected at this stage.
5. Interview techniques were taught to them and a mock interview session was arranged at the institution. A person unknown to these students conducted the interviews and gave each one feedback on their areas of improvement. His help was exceptional as students realized that an experienced person was expecting the same that was being taught.

The remaining sessions were devoted to taking feedback about their experiences during the interview and improving on the suggestions given. The last three sessions were set aside for an overview of the 'Seven Habits of Highly Effective People' - the Stephan Covey method. Teachers were invited to join in for these last three sessions and the experience was of mutual satisfaction.

On the last day of this two months course, the students gifted the teacher with an idol of *Lord Krisna*, who is known to Indians for unfolding the secret of life through his '*Bhagwat Geeta'*. This indicated the satisfaction experienced by students and was also an expression of their gratitude.

The interaction with students however did not end here. They 'accidentally' kept meeting this teacher somewhere near her home. All students hailed from satellite townships near Pune city, located far from the teacher's residence. Several such accidental meetings that continued long after the course was over convinced the teacher that the meetings were intentional. She questioned the students about this and they admitted that they wanted to meet her and derive inspiration as they had done earlier. At this the teacher told them that if they rely on her for inspiration, she would fail in her duty as a teacher. They must be self-motivated, as they would not have any teacher with them for life. They must make progress, without relying on any other person for inspiration. The 'accidental' meetings discontinued after this.

Reflections, Review and Analysis

1. While selecting the students for this course, no criteria were laid down – probably admissions were done on first come first serve basis. Had the basic capability criteria been set, barriers at the fundamental level would have been eliminated. Conversation in English

was the weakest area and remained so even after the end of the course, as the barriers in language learning had obviously been neglected throughout schooling and the situation was one that could not be repaired in a short time span. The designers of the course had designed the course with some basic considerations and familiarity with English language was one of them.

2. Parents of these students did not know the difference between a bachelor's course in engineering and a yearlong course in hardware engineering. It was therefore likely that these students were the first generation to go beyond higher secondary school. It would have been prudent on behalf of the franchisers to interact with the parents and give them a fair idea of the kind of jobs to which the students of their institution become eligible. One interaction with parents would have been enough.
3. Peeping into students' minds gave the impression that they were used to accepting tertiary treatment. This problem was probably created but never addressed in the entire system of schooling. Lack of confidence, lack of self-respect and a sickening acceptance of everything that came their way was obvious. There was no retaliation but a kind of modification of their own behaviour to counter the problems they faced, which could be due to their inability to fight for their rights. Probably there was no awareness about rights.
4. But once they were shown compassion, they became obedient. They could then withstand the challenges put forth by a person they had learnt to trust. They did possess the ability, but probably never realized it.
5. A wide gap prevailed between teachers and students and both remained at different levels until the introduction of a course in personality development. There were no significant efforts to bridge the gap. Had the teachers received teacher training (which, unfortunately they had not!), efforts at bridging this gap would have been attempted.
6. A teacher's role was not fully understood and shouldered by the teachers at the institution, which created further barriers.

Since the challenge was faced, all students completed the course successfully and also secured jobs, though all did not continue with the same field. Though the data about all the students is not available, one student was known to join a dairy and another one secured a job in the United States.

Education for Sustainable Development means education for empowerment. Barriers that are laid during school go unattended, they aggravate and if left ignored even at a later stage, persist throughout life. Such weak citizens then remain weaker pillars of the society. Developing communication skills and personality development (character development - as it must be rightly addressed!) must be an integral part of schooling, which should not be left to be attended to at a later stage in education, because there are no quick-fix solutions to this. With international trade agreements (WTO - GATS) competencies expected are as per global standards and preparation for them must begin with schooling. Empowerment happens when teachers are capable of moulding their students' future. This sense of responsibility and the training to shoulder it must therefore be an integral part of teacher training and teacher training must be an integral part of every teaching opportunity available in the country.

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18. Drivers and Barriers in Pre-School Education for Sustainable Development

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Abstract: Pre-school is the institution that can create the fundamentals of ecological culture, i.e. conscious attitude to phenomena of alive and non-alive nature forming child's closest environment in that period of life.

The majority of our children's "investigations" are experiential and short-term, e.g. how snow melts, how streams find their ways, how bugs on the trees are opening. Playing in research turns quite often into real creativity, and it's not that important if a child discovered anything absolutely new or something well known for everybody.

Pre-school and family are the two educational phenomena, giving children social experience in its own way and only through cooperation they create the optimal conditions for a small man to enter the big world. It is during the pre-school period when the parents are able to accept and understand the information coming from the institution, and ready to cooperate in order to make the child's environment as good as possible. This is the right time to give not only the children, but their parents as well the fundamentals of Sustainable Development (SD) and the initial ideas for its implementation may be at first on a rather small scale.

However, one of the serious obstacles of further development is that schools usually break the continuous process of Education for Sustainable Development (ESD), e.g. in case of health education.

Introduction

We can hardly disagree with the opinion of the founder of Roman's Club Aurelio Peccei that the essence of the problem that humankind faces on the modern stage of its development is caused by the inability of people to adapt their culture to the changes they themselves make in their world; the sources of the crises are 'inside' rather than 'outside' the human being considered both as an individual and as a society. So, solutions to the problems should be found in changing the human being through his/her inner essence.

Since the moment of the baby's birth, it is impossible to waste even a minute. A human being should understand the value of health and one's dependence on good health, and the health of family and friends, and that of all humankind, which depends on environmental conditions and lifestyle. It is evident that children's health providing is the main goal and care of every civilized society.

Human health is a complicated process that starts long before birth and continues during one's lifetime. The health of the generation is a phenomenon which scale is important for the development of any country. Close interrelationship between environmental conditions, life conditions and health of the population is quite clear now. The rate of diseases of newly born babies increases every year. The number of miscarriages and immature births increases as well. Since 1985 the rate of inherited abnormalities combined with the children's death rate are known to grow. All that is the consequence of worsening the first baby's environment – the mother's organism influenced by various climatic, technogenic, social, environmental, political and cultural factors that finally define the lifestyle. The birth of healthy babies has become rare. Having low initial level of health, children are unable to resist the increasing ecological aggression of the environment.

It is a mistake to consider only chemical pollution and toxic compounds to be responsible for the decline in human health. We should take into account all aspects of the environment and lifestyle, i.e. changes in foodstuff and physical activity, informational as well as neural and psychological overloading, etc.

Health and Sustainable Development

Explaining to the child and his/her parents the value of health and its dependence on environmental conditions at all levels of the educational system we shall make an important step

forward towards sustainable development. The parents are the first teaches of a baby. They must form the basis of physical, moral and intellectual development of the child's personality starting with the early age.

Multiple researches held both in Russia and abroad, shows very clearly that family and pre-school are the two educational phenomena, both giving children social experience in its own way, but only through co-operation, they create the optimal conditions for a small child to enter the big world. Considering those during the whole period of education of a child, we can successfully implement education for sustainable development (ESD).

Co-operation between pre-school and parents

Data collected through interviewing the teachers shows that the younger the teacher is the less he/she is eager to contact the kid's parents. Young teachers do not see the necessity in communication and do not know what and how should be discussed with the kid's relatives. One of the drivers in ESD could be inclusion into the teacher education programmes much time for training communication skills to be able to deal with parents. It is necessary to give the teachers methods of work with parents who should not become spectators, but creators, and constructors of their child's personality.

For successful involvement of parents in the educational process, we use the issue of their child's health. Working together with parents for diagnostics of functional reserves of their child's organism, we can find out concrete health problems and ways of their solving joining our efforts. Pre-school and parents become co-thinkers and partners in implementation of environmental health improving programme for children "Towards the Healthy Family through the Pre-school".

Parents loving their children and understanding what it is necessary to do for their future can help implement successfully the ideas of ESD, however to do that the parents themselves need the help of teachers. The main driver in ESD for pre-school can be in uniting the efforts of teachers and parents in protection of children's life and health.

Interviewing parents and asking them to fill in the questionnaires helps to clarify their attitudes towards ESD in pre-school. It also gives information about children’s behaviour outside the institution and indicates professional skills of the teachers.

Methods of work with children

The research in the field of ESD can help develop and implement the new methods of work with children that will help them:

- Understand the laws of environment and human existence and implement them in everyday life;
- Be socially active and able to interact with social environment;
- Consider information critically and make informed decisions;
- Take responsibility for their decision and be aware of their consequences.

One of the barriers for ESD is lack of educational methods for children based on plays and games for practical approval of obtained knowledge. Only environmental education has developed a variety of such methods and programmes. The child is an acting creature and any information he/she gets needs immediate "practical test".

The majority of our children's "investigations" are experiential and short-term, e.g. how the snow melts, how the streams find their ways, how the bugs on the trees are opening. Playing in research, as we have noticed, turns quite often into real creativity, and it is not that important if a child discovered anything completely new or something well known for everybody. The scientist, investigating the issues on the very edge of modern research, and the child, discovering the unknown for him/her world, use the same mechanisms of creative thinking. Creation of new educational methods, techniques and ways for pre-schools based on the specifics for that age kinds of activities: developing games, performances, creativity, art, music, experiments, etc. can be the driver in ESD.

Diagnostics and analysis of upbringing process

Monitoring allows evaluation of mid-way results and make corrections if necessary. In order to monitor the results of ESD the teachers test children's competences in various forms:

- Discussion (a child is asked several simple questions);
- Description of a picture (a child is given a picture showing a certain situation one can see in everyday life and asked to describe the picture and explain and evaluate the people's behaviour; usually the child suggests his/her own way of acting in such a situation);
- Watching (if a child draws teachers' and parents' attention to wrong behaviour or attitude to certain environmental or health problem);
- Modelling a challenge (the teacher creates challenging situations and watches children's behaviour);
- Role-play (children and teacher(s) perform certain challenging situations and discuss the ways out).

Contents and forms of upbringing and education in our institution

The concept of ESD is wider than the school curricula. Our teachers use intensively all form of activities and interaction with children:

- Excursions;
- Walks;
- Discussions;
- Games and plays;
- Performances and celebrations (e.g. Earth's Day, Water Day, etc.);
- Artwork making in mixed groups of children and adults;
- Various contests and competitions for children and their parents as well as teachers (e.g. the best New Year decoration, the best costume for fashion show, the best crossword/puzzle about environment and health, etc.)

Improving teacher training

It is necessary to pay more attention to teacher training in practical classes for arranging the abovementioned activities for children. Plays and games designed for interaction with children can be the drivers in ESD. One of the barriers in developing ESD is that the public awareness in the consequences of anthropogenic impact on the environment is not high enough. Quite often, we know about those consequences too late, and sometimes the population does not get the information at all. However, even if we imagine that we overcame that barrier and got access to all information about existing problems, unfortunately not every teacher would be able to use it in his/her work. In pedagogical colleges and universities, it is necessary to pay more attention to the issues of self-education (i.e. informal education).

Ability to choose relevant information and use it in one's work will allow the inclusion of current issues and recent data into the lessons. The teacher will be able to save time and not wait until the information is collected by somebody, summarized, written in the textbooks and manuals and the latter are approved by the Ministry.

A driving force for ESD includes an opportunity for teachers to constantly improve his/her qualification through refresher courses held at the universities and 'methodological' offices, through attending staff meetings for teachers, consultations, seminars, and training held in various educational establishments.

Conclusion

The ability of pre-school to carry out its activities in multi-variable conditions, i.e. the ability of teaching staff to independently choose educational programmes and techniques according to the age and development level of children, is, for sure, the driver of ESD. At the same time, the absence, in some cases, of the continuity between pre-school and school educational programmes is a barrier for ESD. The school should take from pre-school the best practices in

the field of education and child development as well as through involving parents and co-operating with them, develop and improve relevant methods for the first, second, and maybe also for the third and the fourth grades. We cannot accept that a child coming from pre-school to school quite often has a "shock" and feels many difficulties in integrating him/herself in the new life.

19. Sustainable Education in Everyday Teaching of Teenagers

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Abstract: This is my description of everyday work about sustainable education at an upper secondary school in Gothenburg. We use different methods, for example storyline, interaction with science centers, Virtue, Future City and technology themes to give education in sustainable development a meaning for our teenagers, how it affects their lives. We also use fundamental values, democracy and personal development dialogues as a tool to achieve sustainable development. Our school also use the criteria for sustainable education edited by the Swedish National Agency for School Improvement.

Background

I've been a math, science and technology teacher for over twenty years. My school Burårsskolan is situated in the central part of Gothenburg. We have 420 students ranging from 6- 6 years old. I really enjoy my work as a teacher. It's meaningful, full of surprises and it's really something special to be a part of the life of adolescents, as they leave childhood and find their way to adulthood. The students I teach are 12-16 years old. A few years ago I attended a Montessori teaching course to get an exam, and my classes are Montessori students.

With respect to all schools that try to arrange the schooldays from a perspective that focus on projects, most of the upper secondary schools I've seen in the past 25 years still use a regular schedule as a backbone to organize what time a certain group work with a certain subject. Therefore we need to focus on how we could implement sustainable development into different disciplines in school. We may not forget that we also are bound by law to reach certain achievement goals in each discipline as well as judge the students learning with grades. So whatever what it is we want to teach, we need to follow the rules. That's the frame, now it's up to us to fill it with meaningful education!

Our students

When our students, 12-16 years old, first hear of the term *sustainable development*, it has a very abstract meaning for them. We have for several years worked with different applications to make sustainable development more clear and meaningful. Together in our team of teachers we've developed several methods and included several partners from the society around us. We have 25 students in our classes; they work with a two-year interval, grade 6-7 and 8-9.

We try to work with boys and girls to give them the same opportunities to grow and develop interest for their future and the environment. When we put sustainable development as a backbone into technology we immediately attracted the whole group of girls, as in the past they've distanced themselves from technology.

The staff

With our experience of our teenagers' way of thinking we try to make the approach to all aspects of sustainable development more meaningful and relevant to the stage of adolescence they are in the middle of. We use methods such as Storyline and Montessori teaching. We participate in the Virtue project and in the 'Future City' project.

It is important to break the borders between different disciplines in a secondary school; together we accomplish more than we are able to do alone. We meet at least once a week to plan the agenda. Sometimes we work together on a project, and sometimes we stick to our disciplines. We also have a lot of university students who are on their way to becoming teachers. We function as a training school. It's a valuable exchange between their theoretical knowledge and our practise. We learn from each other.

Storyline

The last three years we've used a Storyline once a year that has a massive impact on our work. It's a huge project that involves our everyday work and for a couple of weeks, we "throw" the

regular schedule away and work continuously with them, for example on the project 'Future living'. The method of Storyline has its origin in Scotland and it really functions well with teenagers. The pupils play a character and that individual gets into a chain of happenings; energy saving, house construction, problem solving, building of a small society. Since we work with the Montessori method we have our classes 2-3 hours with a lot of possibilities to be flexible in cooperation. We also cooperate with our colleagues in social sciences, art, maths, languages etc to achieve our goals. A Storyline is often very meaningful and gives great memories- although we could be really tired in the middle of the process.

Science centers

We are a municipal school and we are situated quite centrally in Gothenburg. We cooperate a lot with a Science Centre, Universeum, which is a 15-minutes walk from where we are. We've just ended a European project about sustainable development called 'Pencil'. It focuses on how science centres affect students when it comes to sustainable development. We've made several visits and even stayed over night- just besides the sharks. Of course we included an overnight stay at the Centre to experience the rain forest with all the animals that are awake in the dark. The students really enjoyed themselves and we also met world famous scientists describing their work with snakes and frogs.

Partners

We cooperate a lot with the Chamber of Commerce and companies in the region. Our partner right now is a construction company called 'Skanska', we've been partners for 4 years and we've followed the building of *Götatunneln* for example. Now we are planning to follow the building of new tunnels, it's the infrastructure of the city that interests us the most.

We – of course-cooperate with the City of Gothenburg, We are a part of the community and we need to keep in contact with politicians and officers. Consumers Office and the Office of Traffic are two partners we find especially interesting for schools to work with. We are right now in the process of developing a webquest about travelling and transport.

It's always important to reach out for the society whilst teaching; we think it's even more important when working with sustainable development. When we make contacts with different companies we aim to find the skills that the students need to development to have a successful career.

Science

Since I'm a science, technology and math teacher I'm trained to focus on the ecological part of sustainable development, but *together* with my colleagues I try to work out a vision where everything is connected and thereby involve all disciplines when we thematically are working with sustainable development. One barrier is still to find clear definition of the marks that fit into the different disciplines, i.e. to convert the overall vision of sustainable development to every single subject that our students receive marks in. That's also a new challenge since the history of teaching at this level mainly has been focused *within* a discipline instead of *between* disciplines.

Since science evolve in such a rapid speed we always come into discussions about right and wrong, moral and ethics, just think about genetics, sexuality, global warming, nuclear power and nanotechnology for example. We must prepare our young citizens for the choices they have to make in elections and other democratic discussions, and make them ready to argue for what they believe in, and give them the basic facts from where they can build their opinions. From my point of view it's really bad for democracy if our citizens are scientifically illiterate!

Technology

In 1994 the subject technology had a metamorphosis in Sweden- from a subject that focused on machines and motors and that could be chosen, to a subject that was compulsory for all students. Then we had to think and rethink about how to use our skills to give the students what the new agenda said. Year by year we found out that sustainable development is the glue that gives the

subject technology meaning. We often work in projects and use our hands to build models, ***the way to our brain goes through our hands*** is an old Montessori saying.

Virtue

We've been a part of the Virtue project for 4 years we've put out a rack of compact discs in the ocean, on the island of Källö-Knippla. We go out there to count the organisms living on it and we put our results in a database administrated by the University of Bergen (Norway). We feel that we are part of something big, the student's practise on scientific work, and we could for example talk about boat colours that destroy the bottom of the sea. The keyword is biodiversity, so that's a frequent discussion what that really means.

Future City

Once a year, once in the four years we have our students, we build a future city. It's a model in scale. We do a virtual model; first in Sim City, then we build it together. A lot of thinking about school, work, building a society together. We've had wonderful discussions about transports, energy sources, a good living.

Then we display our model for a jury and the students have to describe their ideas to "unknown grown-ups" and thereby practice their communication skills in a sharp project.

Evaluation

We evaluate our way of teaching quite a lot, often with help from students from the University. Our pupils evaluate their work every week in a diary. Every term we have a larger evaluation both with open questions as well as more focused questions. As an effect the students wanted more science on there schedule this spring, so that's what we have now.

Goal- and achievement-related grading

When the school and course curriculum were introduced, a new grading system also came into effect. The new system awards grades on a 3-point scale, with the possible grades of: Pass (G), Pass with Distinction (VG) and Pass with Special Distinction (MVG). When we work with sustainable development we find the different levels possible to use even though a lifestyle never can be graded. But it takes a lot of discussion together with our colleagues to calibrate our definitions of the scale.

Parents

We think that involving the parents is important, especially when you change the way of teaching compared to the way their own education was. Therefore we mail and see the parents quite often to get them involved. Their support is important to us.

Democracy, fundamental values and health

Since these things belong to sustainable development we find several ways to involve them. The school's task to promote the learning of children and youth cannot be separated from the democratic assignment. Rather, there is much to suggest that the two are promoted by the same set of factors. Working with the value system and developing good health should therefore both be based on a holistic approach to the learning and development of children and youth. That´s another reason for why sustainable development is important. We also work with these questions as a discipline and in socially sustainable development we have a good chance to evolve the teenagers on the notion of self respect, and mutually respectful behaviour towards each other, CPR (cardiopulmonary resuscitation), massage, coping with stress etc. We meet every week with our students around that theme and it's also a successful model to keep discussions focused.

Personal development dialogues

On at least one occasion per school term, the teacher, student and student's parents meet to discuss how the student's learning- and social development can best be promoted. This dialogue

gives students a voice, allows them to take responsibility, and empower them in their school situation and the planning of their studies. Parents receive the necessary information on the objectives of the school and how schoolwork is organized in order to provide their child with proper support. Teachers are given an opportunity to find out about how the student and parents see and experience things, and an opportunity to motivate how their teaching is organized, and how they assess the student's work and progress. It is important that all parties involved in the development dialogue are aware of school objectives and the content of school and course curricula and local work plans. This is another perfect arena to talk about sustainable development.

ROSE

The ROSE-project (The Relevance Of Science Education) collect data from teenagers attitude towards science, environment and technology with a special focus on experiences, interests, future plans, that's a part of sustainable development education as well. I use their data to find out what´s most interesting for teenagers, that´s a good place to start to get their attention. From the ROSE-data there is some evidence that girls and boys find different things interesting, but astronomy, poisonous snakes and adventures as well as sustainable development score high points.

Conclusion

It takes a variety of methods to keep our teenagers interested in school. Adolescence is a very important period in a person's life, when the personality is being formed, and lifestyle takes out its bearings. To work with teenagers is a challenge and sometimes a struggle, but I find it's worth it!

I've been a teacher for twenty years and have never been bored- although sometimes tired. The Swedish school has never in modern time had so little resources as we have now and some people even call it a crisis. We must watch carefully to maintain high standards in our education; we hope that sustainable development is a factor that can give the necessary political focus back on school again. Everyday we teachers think and rethink. We can see that we've taken a few steps in the right direction, and still have a long way to go, so we never rest and say, "We're done".

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Annex A: Supplementary Article

Education for Sustainability: Looking for Directions

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Abstract: This paper traces a genealogical path of education for a sustainable future that links the concept to its roots in environmental education. In doing so, it attempts to grapple with the issue of developing guiding principles that might inform our efforts, without losing sight of the variety of situations and local contexts that occur throughout the world. It is a key conclusion, however, that it is the values and assumptions that inform the application of such principles, that will in the end shape practice, and that these require careful and critical analysis.

Introduction

As educators we face the complex task of developing a public consciousness about issues related to sustainability, of doing so in multiple and complex contexts, and trying to develop a useful language that allows us to communicate effectively. One issue we face is that national situations and challenges vary immensely. Given this circumstance, it is important to clarify what Education for Sustainable Development (ESD), or alternatively, education for a sustainable future, actually is. This paper is an attempt to shed some light on that issue, but because (given the meaning often attached to the word 'development') even the name is problematic, I am going to play safe by saying education for sustainability (EFS).

It is interesting that in beginning of her book summarising the state of environmental education at the end of the millennium, Joy Palmer (Palmer, 1998) gave as one of her reasons for writing that she saw people all around the world continually 're-inventing the wheel' as they grappled with the same tasks in isolation. There is a tension, as Ian Robottom (2003) points out, between developing a set of guiding principles for the field and allowing for local context. While I am aware of the difficult nature of this tension, I sense that the lack of clarity about EFS is becoming a barrier to progress, particularly as planning for a large follow-up in Sweden in the next year or two takes shape. In response, I am attempting to provide some background on this issue without being prescriptive. I am seeking to avoid the trap of sounding as if I have all the answers by writing in a personal style. This is how I see things. Perhaps it will be helpful to others. Before beginning that task, I need to develop a metaphor that illustrates the nature of my attempt to do this.

This metaphor draws on the cultural traditions of the Maori people of Aotearoa-New Zealand. Within Maori society, 'whakapapa', or genealogy links all things in kinship that traces back to Papatuanuku and Ranginui, the ancestral progenitors of all things. All things, living and non-living were 'released' when Papatuanuku, the earth mother, and Ranginui, the sky father, were prized apart from their primal embrace by their children. Through 'whakapapa', humans have kinship ties of mutual respect with all creation. A person's genealogy, their 'whakapapa', places them in the order of things. Local groups have bonds through kinship links back to common ancestors and these bonds also link people to the land for which they have custodial responsibility. Of significance to what I want to say here is that knowledge too has a 'whakapapa', arising through people's activities and linked to place. Knowledge has little meaning when removed from the events and people who learned hard lessons and were shaped by them in developing that knowledge.

In this light, the field of environmental education has a 'whakapapa'. Both Palmer (1998) and Annette Gough (Gough, 1997) traced that genealogy in different ways in providing background to the field in the late 1990s. Gough actually identified her summary of the development of the field as genealogical. It is my view that the development of EFS has failed to recognise this 'whakapapa' of the field and as a result, lacks direction. This may be deliberate and cynical but that argument is not important here. Of course, not everyone needs to be an expert in this 'whakapapa', but some people do.

There is one more thing about 'whakapapa'-genaelogy. I have two parents. I have four grandparents, eight great grandparents and so on. Thus, I do not have a single 'whakapapa'. I can choose which line or lines to trace back, and if there are links between them, I might even change lines. I want to emphasise then, that in trying to provide a brief background here I cannot be definitive and am attempting two things. One is to provide some very brief illumination to the background of our field. The other is to point to some sources that readers might explore if they want more detail. I have already identified two such sources.

Early events

There was a growing awareness of human impact on the environment, which was brought into focus by books such as Rachel Carson's *Silent Spring* and Elvin Toffler's *Future Shock*, along with calls of concern from the scientific community. A series of three meetings was initiated by UNESCO and involved both the launching of the United Nations Environment Project (UNEP) and the development of a structure for environmental education. The first was in Stockholm in 1972. The second, at Belgrade in 1975, was a meeting of environmental educators and produced the Belgrade Charter. The third, at Tbilisi in Russia in 1977, was an intergovernmental meeting and produced the Tbilisi Declaration. It is here that the concept of 'whakapapa' is important. These three meetings provided a broadly based and ongoing process of development that developed a structure for the field.

According to Professor Peter Fensham who attended both the latter two meetings, and who told this story in a conference presentation in Australia some years ago, some very important events took place at Belgrade. The original agenda had a very 'western aid' flavour and delegates from southern countries, lead by South American delegates, challenged this. The chairperson, the late Professor Bill Stapp, had the courage to largely abandon the agenda and allow a more representative vision to arise from the meeting. Thus, in the Belgrade Charter (UNESCO-UNEP, 1976), poverty is raised as a key issue in the opening paragraph. A new global ethic is called for and the natural environment identified as intimately interdependent with social, cultural, political and economic considerations. The charter is a very interesting document and many aspects of it can be seen in the Tbilisi Declaration (UNESCO-UNEP, 1978), but in contrast, the Declaration is an intergovernmental proclamation.

The Declaration provides sets of goals, objectives, principles and criteria for environmental education, and while Gough (1997) critically analyses the differences in content and tone between the Belgrade and Tbilisi documents, Palmer (1998) points out that the latter remains the blueprint for environmental education in many countries. It covers a range of levels from governmental to local and is a complex statement. I have attempted to summarise some of the key aspects of it that apply at the level of schools and classrooms in the table below, but point out that this is a huge simplification. It summarises only the major features.

It is important to note that while the Tbilisi Declaration calls for new patterns of behaviour, it does not specify what those patterns might be and is thus quite open to interpretation. Nor does it specifically mention poverty as an environmental issue.

Sustainability

The concept of sustainable development was popularised by the report *Our Common Future* (WCED, 1987) produced by the World Council for Environment and Development and often called the *Bruntland Report* after the commission's chairperson. The concept had arisen before this, at least as early as 1980 in the *World Conservation Strategy* (IUCN, 1980). The Bruntland report was about economics, not education. It has few references to education and even its attempts at describing what sustainability means are confused.

The WCED report defines sustainable development as that which:

> *… meets the needs of the present without compromising the ability of future generations to meet their needs. (WCED, 1987, p. 8).*

The report goes on to say:

The concept of sustainable development does imply limits – not absolute limits but limitations on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organisation can both be managed and improved to make way for a new era of economic growth. (Ibid)

Thus the concept of sustainable development was closely linked with that of economic growth. The report grapples with this issue when it contends:

The essential needs of vast numbers of people in developing countries – for food, clothing, shelter, jobs – are not being met, and beyond their basic needs these people have legitimate aspirations for an improved quality of life. (WCED, 1987, p. 43)

It goes on in following paragraphs to add:

Living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard to long-term sustainability…

Meeting these essential needs depends in part on achieving full economic growth potential and sustainable development clearly requires growth in places where such needs are not being met. Elsewhere it can be consistent with economic growth, provided the content of growth reflects the broad principles of sustainability and non exploitation of others. (WCED, 1987, p. 43-44)

The point here is that even in launching the term, the WCED was not clear about its implications. Alternatively, the commission did not want to face up to the implications of what it was saying. Even the comfort of the definition is lost when you realise that the key words, "needs" and "compromise", require interpretation. I have attempted to do this in the table below. The section in italics is derived from considering the implications of the phrase from the WCED quote above: "the ability of the biosphere to absorb the effects of human activities".

A framework for school based environmental education

Environmental Education is directed towards establishing new patterns of behaviour by individuals, groups and society as a whole toward the environment.

Programmes should assist learners to understand the complex nature of the natural and built environments, the social, political and cultural factors that influence them and their interdependence including that between urban and rural environments.

Programmes need to develop Awareness, Knowledge, Attitudes, Skills and Commitment to participate in the solution to environmental problems.

Important in this process are positive environmental values, self-discipline, critical thinking, data interpretation and practical problem-solving skills. Influential factors in developing these abilities are:

- an approach which integrates traditional subject disciplines using real local problems, particularly in early years; develops knowledge and considers national issues whilst balancing current and historical perspectives; and
- identifying and analysing the value positions that inform behaviour while also discovering the symptoms and real causes of environmental problems;
- utilising a wide range of learning situations and approaches which stress practical activity and first-hand experience, allow learners to have a role in planning their learning experiences, making real decisions, taking action and accepting the consequences.

Environmental education should be a life long endeavour towards a sustainable future in which resources are not used faster than they are replaced, wastes are not produced in excess of the planet's capacity to dispose of them, other living things are not jeopardised, and the physical environment is minimally disturbed.

There are now, however, dozens of definitions of the word and as a result it has become little more than a slogan. John Huckle (1991, 1993, 1999) has continued to draw attention to the point that the notion of sustainable development:

Fails to analyse causes, uses vague code words to rally support, seeks solutions that do least damage to the existing order and identifies the executors of solutions within the existing power structure. (Huckle, 1991, p. 53)

It must be kept in mind that revisioning environmental education as education for sustainable development (ESD), the term I have preferred not to use, conveniently removes the transformative agenda embedded in environmental education by the deliberations at Belgrade and Tbilisi, that is, new patterns of behaviour. Certainly, ESD is a different branch of the 'whakapapa'/genealogy. UNESCO (1996) linked these two genealogical lines in claiming that all its work relating to environmental education/ESD was informed by the principles from Tbilisi. That being the case, the distinctions between the two are semantic and Tbilisi becomes the legitimate foundation for both EE and ESD/EFS.

An alternative to this genealogical line is the NGO Treaty that was developed in meetings leading up the to the 1992 Earth Summit at Rio. Annette Gough (1997) introduced aspects of this in her book and was courteous enough to provide me with a copy. It set our "Some Principles of Environmental Education for Equitable and Sustainable Societies" as follows:

1. Education is the right of all; we are all learners and educators.
2. Environmental education, whether formal, non-formal or informal, should be grounded in critical and innovative thinking in any place or time, promoting the transformation and construction of society.
3. Environmental education is both individual and collective. It aims to develop local and global citizenship with respect for self-determination and the sovereignty of nations.
4. Environmental education is not neutral but is values based. It is an act for social transformation.
5. Environmental education must involve a holistic approach and thus an interdisciplinary focus in the relations between human beings, nature and the universe.
6. Environmental education must stimulate solidarity, equality, and respect for human rights involving democratic strategies and an open climate of cultural interchange.
7. Environmental education should treat critical global issues, their causes and interrelationships in a systemic approach and within their social and historical contexts. Fundamental issues in relation to development and the environment, such as population, health, peace, human rights, democracy, hunger, degradation of flora and fauna, should be perceived in this manner.
8. Environmental education must facilitate equal partnerships in the processes of decision-making at all levels and stages.
9. Environmental education must recover, recognize, respect, reflect and utilize indigenous history and local cultures, as well as promote cultural, linguistic and ecological diversity. This implies acknowledging the historical perspective of native peoples as a way to change ethnocentric approaches, as well as the encouragement of bilingual education.
10. Environmental education should empower all peoples and promote opportunities for grassroots democratic change and participation. This means that communities must regain control of their own destiny.
11. Environmental education values all different forms of knowledge. Knowledge is diverse, cumulative and socially produced and should not be patented or monopolized.
12. Environmental education must be designed to enable people to manage conflicts in just and humane ways.
13. Environmental education must stimulate dialogue and cooperation among individuals and institutions in order to create new lifestyles which are based on meeting everyone's basic needs, regardless of ethnic, gender, age, religious, class, physical or mental differences.
14. Environmental education requires a democratization of the mass media and its commitment to the interests of all sectors of society. Communication is an inalienable right and the mass media must be transformed into one of the main channels of education, not only by

disseminating information on an egalitarian basis, but also through the exchange of means, values and experiences.

15. Environmental education must integrate knowledge, skills, values, attitudes and actions. It should convert every opportunity into an educational experience for sustainable societies.
16. Education must help develop an ethical awareness of all forms of life with which humans share this planet, respect all life cycles and impose limits on humans' exploitation of other forms of life.

This is a much more comprehensive and direct statement of what EE/ESD should be about than that ratified at Tbilisi. Clearly, an intergovernmental statement (The Tbilisi Declaration) is carefully worded and must be of a general nature in response to the multiple contexts in which it will be used. It is also written fifteen years later, but it is also clear that the NGO Treaty is informed by the material from Belgrade and Tbilisi.

It is at this point that I want to return to the metaphor of 'whakapapa'. It is a matter of professional and political judgment as to what form of EE/EFS one feels comfortable to advocate. What is probably most important is what we **do** rather than what it is **called**. There are, however, foundations to our field that have been established for us through the efforts of those who have gone before us. Knowing the 'whakapapa' of the ideas we put forward gives those ideas the legitimacy of those that developed them. It links us to those who have gone before us in developing these ideas and allows us the support of the frameworks they have provided. Whatever set of guiding principles, whatever branch of the genealogy we use, it seems vital, in my opinion, that they are robust and that we know where they came from. EE/EFS is about change. That is what must not be forgotten, and Huckle's suggestion is that the shift from EE to ESD may serve to obscure the transformative goals of the field.

There are some underlying issues to this confusion that people attempt to side step by the invention of new names. Timothy O'Riordon (1989) identifies different philosophical positions that commonly underpin European environmentalism. There are two broad camps, 'technocentric' and 'ecocentric'. The first gives prime importance to people and technology while the second emphasises the natural environment. Within each camp are two subgroups: Techno centric 'interventionists' have complete faith in human ingenuity, science, and the market to solve all problems and improve the quality of the environment. Technocentric 'accomodationists' largely follow this view but with some hesitation. They believe some accommodations are needed to mitigate the impact of humans on the environment. Accommodationists are the overwhelming majority. They want an undisturbed environment but also want a nice car, house, and holidays overseas.

In the other camp are 'communalists' who take an eco-socialist view that protecting the environment requires system change towards locally based, cooperative and self-reliant economic activity - This is in the opposite direction to globalisation. 'Gaianist' ecocentrics generally lean toward giving intrinsic value to nature and to personal change, although this is the hardest group to describe because it is the most diffuse. The point is that people with fundamentally different values can use the same environmental goal statements and language and mean completely different things. This can be very confusing. It can also result in people leaving a meeting in apparent agreement but being horrified at how the agreement is later interpreted. Let me explain. An interventionist would say that we have continued to damage the environment because goods and services have not been priced to include the social and environmental cost of their production and consumption. These are 'external' to the cost equation. These 'externalities' need to be 'internalised' by costing and charging for environmental impact. In order to do this we need to privatise everything and have a completely open market. On the other hand, a communalist would scoff at that and say it sidesteps the issue that the prime purpose in a capitalist economy is to accumulate surplus through profit and in order to increase profits we need to consume ever more. You cannot 'conserve' under a capitalist economy, it is impossible, the communalist would say.

Clearly, these people would have different views on what "new patterns of behaviour" might be. Thus, I make the point again, that EE and ESD/EFS may be the same or may be

completely different, depending on the driving values. EE, however, does have a set of goals and detailed supporting material in the Tbilisi Declaration (UNESCO-UNEP, 1978) and Belgrade Charter (UNESCO-UNEP, 1975) about which discussion can occur. ESD/EFS does not have such a clearly identifiable foundation.

The term Education for Sustainable Development has a history, its 'whakapapa' is confused though because he term lacks foundational statements and because so many people have used it with so many meanings. Thus, O'Riordan (1989) considered the term 'sustainable development' to be the refuge of the environmentally perplexed. Indeed, the report itself (WCED, 1987) is most confused about what sustainable development is, as I discussed above, and I suspect that is because it would be unacceptable to say that the rich nations are rich enough and cannot continue to grow at the expense of the world's poor. Most importantly though, the Bruntland report is about economics, not education.

So to return to my theme, the UNESCO-UNEP material has a clear 'whakapapa' and provides a legitimate foundation on which to build. Legitimate because it involved intergovernmental agreement. The NGO treaty arises from an alternative genealogical line and provides, in my opinion, an undervalued guide to what EE/EFS could look like. However we choose to shape EE/ESF in our own contexts, I think there are two factors to be clear about. First that we have an understanding of the 'whakapapa' we are participating in, and secondly, that we are clear about the values and assumptions that underpin what we are doing. EE/EFS is about changing human behaviour in order to reduce the impact of 'development' on people and the environment. Currently, these appear to be getting worse rather than better. Technocentric approaches seem to be part of the problem. That is not to dismiss science and technology. It is to challenge the values that currently dictate the ends that science and technology and market economics currently serve.

Note: Copies of parts of some of the documents referred to here are available at: http://education.massey.ac.nz/environment/about.htm

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Annex B: Abbreviations & Acronyms

AUO	Allmänt utbildningsområde/General Subject Courses
C2005	Curriculum 2005
CADISPA	Cooperation and Development in Sparsely Populated Areas
CBS	Central Bureau of Statistics
CF	Community Forest
CFUG	Community Forests Users Group
C of E	Church of England
CPD	Continuing Professional Development
DEFRA	Department for the Environment, Food and Rural Affairs (UK Government)
DfES	Department for Education and Skills (UK Government)
DFSC	Department of Forests and Soil Conservation
DoE	Department of Education
EAL	Environmental Action Learning
ECD	Early Childhood Development
EE	Environmental Education
EE/ESD	Environmental Education/Education for Sustainability
EEE	Environmental Ethics Education
ESD	Education for Sustainable Development
FEE	Foundation for Environmental Education
GATS	Global Agreement on Trade in Services[1]
GoN	Government of Nepal
KOEE	Kenya Organization for Environmental Education
LEA	Local Education Authority - UK Local government
LHF	Lease Hold Forests
LHK	Lärarprogrammet, inriktning hem- och konsumentkunskap = Teacher Education Programme, Focus Home and Consumer Studies
Lpfö 98	Curriculum for the pre-school
Lpo 94	Curriculum for the compulsory school
MDG	Millennium Development Goals
MOPE	Ministry of Population and Environment
NFE	Non Formal Education
NGO	Non-Governmental Organisation
NRM	Natural Resource Management
OFSTED	Office for Standards in Education (UK Government Education Inspection Agency)
RNCS	Revised National Curriculum
SATs	Standard Assessment Tasks – taken in UK schools at 7, 11 and 13 years
SD	Sustainable development
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VFU	Verksamhetsförlagd Utbildning/Teaching practice
WCED	World Commission on Environment and Development
WTO	World Trade Organization[2].
YFS	Youth Forum for Sustainability

[1] The GATS was inspired by essentially the same objectives as its counterpart in merchandise trade, the General Agreement on Tariffs and Trade (GATT): creating a credible and reliable system of international trade rules; ensuring fair and equitable treatment of all participants (principle of non-discrimination); stimulating economic activity through guaranteed policy bindings; and promoting trade and development through progressive liberalization.

[2] The World Trade Organization(WTO) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business

Annex C: List of Particpants

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