Creating learning environments for the future

Research and practice on sharing knowledge on ESD

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A composition of articles shaped and reshaped through lively discussion during the Leuven ENSI conference 2009

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The ENSI Conference, held in Leuven/Belgium, 26 – 28 March 2009, was focused on the current debate on students' learning journeys and on teachers' competencies for ESD. The second term in the limelight of most presentations and in all workshops was 'Learning environments'.

More then a hundred participants shared experience and expertise and developed new ways to strengthen competencies and to reflect on learning environments for ESD. The outcome of the conference was tangible indeed: two proposals for Comenius multilateral networks were formulated and submitted, from where one was selected and got started in October 2011 with 29 partnering organisations from 17 countries. The multilateral network CoDeS explores new ways of collaboration between schools and communities for sustainable development (for more information see www.comenius-codes.eu)

This conference report gives an overview on the Leuven Conference and reflects the state of the debate on mainstreaming ESD in the second half of the UN-Decade.

In this report we reflect on the three main issues that have characterised the ENSI work in the past ten years which are also the key factors in better understanding and designing ESD: the importance of specific learning environments, the whole school approach and the quality criteria for ESD schools, and the teachers competencies needed for an ESD oriented learning environment. Each of these issues are discussed in a similar structure: the keynote presentation, a workshop presentation, a workshop report and if available the workshop papers presented by the participants.

Many thanks go to the authors, the key-note speakers, the workshop leaders and to the ENSI Junior Researchers. Their contributions provided an insight to the conference activities and allow sharing the wealth of the ENSI Conference 2009.

Berne, March 2012
Christine Affolter, Head of Secretariat ENSI

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Preface

Right in the middle of the UN Decade of Education for Sustainable Development and back to back to the UN conference on Education for Sustainable Development (ESD) in Bonn, the organisation ENSI ivzw organised from 26 until 28 March 2009 an international conference *'Creating learning environments for the future – sharing knowledge on research and practice'* in the University College of Leuven (Katholieke Hogeschool Leuven). It was not by coincidence that this University College was selected for the organisation of this conference as it strongly supports sustainable development and as it puts a lot of effort in integrating sustainable development and education for sustainable development in the curricula of the different bachelor degree programmes, including the pre-service teacher training programme.

About 120 participants coming from 24 different countries as far as Japan, the Republic of Korea and Australia in the East and the South East and to Canada in the North West, registered for the ENSI conference, including representatives of the international organisations such as UNESCO, OECD, the European Environment Agency (EEA) and research institutes such as the Institute for Global Environmental Strategies (IGES), which are all key-players in the ESD story. Today we see a lot of initiatives which focus on ESD, which is without any doubt related to the Decade of Education for sustainable development of the United Nations, which runs from 2005 until the beginning of 2015. This means that today we are half-way the Decade which might be a good moment to look backwards and to look into the future.

Researchers and teachers involved in the ESD story don't need to be convinced about the many challenges we, our children, grandchildren and grand-grandchildren will be confronted with, if we will go on with the same lifestyle as we use today. Slowly policy-makers come to the same conclusion and especially today, when the economic crisis is everywhere, we hear more often than ever before the message that this crisis should be seen as an opportunity to be innovative and creative.

An influential Belgian economist wrote a very successful book 'The Econoshock' (Noels, 2008) in which he enumerates six important economic shocks which will change our lives, but even more drastically the lives of the next generations:

- Demographic changes
- The shift of the economic gravity point to the East
- The information and communication technology
- The end of fossil fuels
- The new capitalism
- The greening of the economy.

When we are talking and teaching about sustainable development, then one should definitely deal with these so-called econo-shocks.

Also educational policy-makers and curriculum developers become increasingly aware of the importance that teaching and learning about these sustainability challenges should be integrated –one way or another- in the curricula of all levels of education, a request which is also prominent in many policy documents of authoritative organisations like UNESCO and UNECE.

So far ESD has mainly been discussed at the level of educational policy makers. It does not mean that we cannot identify schools which make serious progress in becoming learning centres for sustainable development, but we are still in the stage of piloting and far away from a mainstream process. But this is exactly the main objective of the ENSI network: facilitating the process of mainstreaming ESD in all schools, at all levels.

In 1986 ENSI was founded as an OECD-CERI decentralised research network, focussing on scientific evidence for strategies to implement 'environmental education' in all levels of education. From the early beginning, ENSI had a very broad view on the concept of the environment: it not only regards the physical, but also the social and economic environment as they form together the integrated 'environment' we live in.

It was only a small step then to move onwards to education for sustainable development. The last years, ENSI has been very productive in different projects and almost all results of these projects are published and can be directly downloaded from the ENSI website. Many of them are also available as hard copies.

Particularly the publication on the quality criteria for ESD schools has been very successful and has been translated in 13 different languages. Many educational authorities, school directors and teachers are using this publication as a guide for quality management of the ESD process in their own country or school and several amongst them adapted the publication already to their own specific context.

The outcomes of the European Comenius-2 ENSI project CSCT on teacher competences for ESD have been used by the UNECE as a starting point for the expert group on teacher competences for ESD.

During this ENSI conference the participants reflect on what has been developed so far, sit together with experts, both from the practical as from the theoretical side, to share ideas and to develop new ones in order to find learning environments which will be supportive for ESD. And I am glad that the experts contacted, were prepared to give a presentation about their work and research which is strongly connected to the theme of this conference.

The first day of the conference was devoted to four key-notes; the second day the participants were asked to share their ideas and experiences about ESD and learning environments with other participants. A group of young researchers, which are supported by ENSI, produced the conference report.

I hope this conference report will be useful not only to the participants of this ENSI conference but for so many other people, dealing with ESD in their daily practice.

Dr. Willy Sleurs
President of ENSI inpa

Learning environment, the need for rethinking the term

Johannes Tschapka

We can see learning environments as place wherein persons or group of persons do their social practices of diverse sorts. Learning is just one sort of those practices. The reason for centering social practices is that it allows a perspective of social action and agency. Learning environment discussed here exceeds a simply physical environment. It can be seen as a model for the situation a person is immersed in and comprises psychological factors and social relationships. The danger lies in the fuzzy concept of learning environments as pointed out in the conference at several occasions. Especially in the pedagogies of Environmental Education and Education for Sustainable Development an ill fed irrational act might lead to the assumption of learning in or about environment as the only valid interpretation of learning environments. It also might lead to the arbitrary idea that learning in real environment as practical experiences alone can serve as major source for learning. Therefore the concept of learning in the field of Education for Sustainable Development as well as the notion of environment had been examined carefully in the conference.

Learning persons or group of persons enter specific situations not as an end. They enter situations as a construction of meaning. This meaning shapes their alternatives they have to act or reject, to solve or to fail. Using situations as the point of departure involves referring to the experiences of learners in situations. That is, both in the classroom and in everyday life. The everyday practice of a person in situation is intimately linked to the development of his or her actual competence. The notion of situated learning suggests a way of thinking about learning as a nexus of relations between persons who do something in situations. Actually the world defines the situations in which a person or group of persons are immersed. In our considerations about learning environments in the conference we took into account which role the environment and person relation plays for an individual to successfully meet the demand given in a specific situation.

Every situation in which a person or a group of persons immerse is placed. A place has been in one of the workshops defined as a socially constituted environment. This constitution underlies the understanding a person or a group of persons have explicitly or implicitly of the environment they are in. The environment can be characterised by the persons due to the meaning they attach to that environment or which is mediated through the society. Such any

environment can offer ground for learning. In any environment persons or group of persons can deconstruct the meaning of the place they are in and build new insight views or competencies to solve situations they are confronted within the given environment. The question which should interest us here is, in which direction such a learning process supports the development both of the persons involved and of the society they are situated in and which criteria must an environment fulfill to empower learning as sustainable development.

Basically most lectures and workshops focussed on the design of environments to serve as learning facilities. The range of learning environments has been rather broad. It can be stated that various kinds of mediatied reality might serve as a learning environments. Nature as well as virtual worlds in the internet, a textbook as well as participation processes in regional or local sustainable development processes.

Empowerment has been mentioned in several workshops. In most cases it has been connected to the term of participation and the idea of pupil centred pedagogue. It had been widely discussed that Education for Sustainable Development needs a transformation of educational approaches in terms of teaching methods and learning environments. Its particular concern is related to radical changes that are taking place in contemporary social life. Tendencies like globalisation of communication and consumption, economisation of public sectors like schooling and interculture of lifestyles figures within processes of change. This shifts the relationship between our academic practices we offer in traditional ideas of education to other social elements within networks of everyday practices. We cannot take the role of social practices we have known for granted. There seems a need to establish analysis of the ways of teaching and learning environments as designs for learning to react on that changes going on. Specific learning environments may be more or less important and salient in one practice of teaching and learning than in another.

ENSI engaged into works on insight analysis of such changes and into in-depth knowledge of epistemological approaches which serve to such analysis. The conference showed the importance of empirical capacity in educational research for system steering and for practitioner's tacit knowledge of teaching. Learning processes had to be challenged in regard to change management in recent educational neoliberal reforms and in regard to re-designing globalised learning environments. As such future developments had to be considered concerning shifts in schooling which have been stated in future scenarios by the OECD. Three major scenarios seem to shape our schooling environments in the future: Attempting to maintain the „status quo", without capacity to react on future demands and keeping bureocratic management alive; „de-schooling" through privatised market model and network of independent learners; or "re-schooling" through a shift towards a community learning centred approach with strong public orientation. Whatever trend will come up on top it will

shape the learning environment and challenge the attempts of Education for Sustainable Development.

Concerning learning environment as a basis for providing information, mediating knowledge and offering action taking all workshops stressed the need to sharpen and contrast implicit concepts of knowledge and competence building. In concepts and practices of the education research community there seems a need to clarify how to use learning environment as an inner concept of facilitating learning as a situational meaning for the single learner situated in a society of predominately non-sustainable social practices. Especially the term of development had been criticized due to its contiguousness to the term growth which is widely used in economical sense as value creation to satisfy the request for satisfying capital interests. Searching the rush to develop new projects or new programs, it must be questioned which understanding of development we share which fits with the idea of sustainability contrasting to economical growth concepts of development for added value only.

Reorientation and reconceptualisation had been leading items throughout the discussion phase although theoretical and empirical clarifications in detail are outstanding. Learning environment is therefore not only a term for an artificial learning mediator but also ground for schools and educational organisations to serve as education research and learning environments themselves. This derives from the idea of Education as Sustainable Development in the sense of an explicit discursive culture instead of an affirmative approach to learners. Learning environment therefore does not lay somewhere outside to be learned by distinct learning persons. Learning environments figure in ways of reflexive self-construction of learners and in the constitution of their identities. In particular education as a sustainable process might produce potentially social determined ways of sustainable practices.

Education for sustainable development and globalisation

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This contribution consists of three elements. Firstly I will explore how I see globalisation within the context of educational goals and objectives. Secondly I will try to trace the consequences of such a perspective for Western educational methods. In the third place I will attempt to draw out those elements which allow for a pedagogical - didactical approach to ESD.

GLOBALISATION

Globalisation is usually linked to such fields as the global economic crisis, the global climate change and the eradication of poverty. Of course we can also speak of the globalisation of sport, mobility, art, culture, medical innovation, the fight against crime and so on. We can also think about the impact of globalisation on education. However this impact is less obvious and the available literature is diverse. There are trends that can be observed but a global and general trend has not been emerged yet. Nonetheless I will try to show the various trends in an orderly fashion and from a perspective which shows four layers of interrelated influences which are at work.

We can situate this process of globalisation as a process of worldwide influence ranging from its widest to a rather narrow layer. The first layer can be considered as the global world. The second level is that field of activity which Huntington (1996) has called `The Clash of Civilizations'. A civilization is to be understood as a view of life, an idea, which forms a common unifying concept for a number of countries and peoples. It leads to a common culture. The third layer is that of the super-national organisations which can exist within a civilisation. Within the Western Civilisation the European Union can be considered an example of a super-national organisation. Within this third layer there are also the lesser entities of the Nation States. My conviction is that the diverse levels of organisation can, each on its own way, influence those levels beneath it but can also exercise an influence of resistance towards those levels above its own level. An example of this low-down influence can be seen in the resistance Ireland showed to the obligation of the European Union for an expanded integration. Europe, in turn, can offer resistance to certain aspects of Western Civilisation such as those found in

the Anglo-Saxon countries (USA, Canada, Australia, New Zealand). The Western civilisation, on its turn, can also play the role of a filter for those ideas which are promoted on a global scale. In the following paragraphs I will focus on these four levels.

On the global level we can recognise issues such as climate change, the abolition of poverty, and the rules used in sport, etc. But also -and this becomes more than ever a pertinent theme- the worldwide economic forces of the Free Market system with its typical features such as competition, the growing discrepancy between rich and poor, capital transfers, outsourcing and so on. The relentless onward march of the information super highway and global communication are other aspects derived from this world wide web of the Free Market's economic forces.

In fact we can proceed to the level of Civilisation, with the necessary critical view, as outlined by Huntington who has delineated eight civilisations of which the eight one, the African, is to be viewed as a speculative process. The remaining seven are:

- The Islamic
- Chinese
- Hindu
- Japanese
- The Latin-American
- The Orthodox
- The Western

Noticeable in such an outline of civilisation, which is legitimised by historical arguments, is the role or function of religion as a central, unifying concept. Christianity, Islam, Hinduism, Confucianism and Orthodoxy are, in certain civilisations, extremely relevant. Such a cultural unity can even become a key factor in a civilisation. Civilisation and culture have a strong influence on values, behavioural standards, institutions and patterns of thinking which remain of essential value generation after generation.

The third level of globalisation is the super national one. The European Union is a well known example of such an institution which unites nations and people. Regarding the influence it exerts, it is also a very the strong one. Other comparable groupings are the NAFTA, MERCOSUR, ASEAN, etc.

In applying the process and progress of globalisation we are faced with a complex filter system which operates from the upper level to the lower levels but also from opposing forces which operate in order to preserve the lower levels in relationship to the upper ones. Then, we are faced with two fields of forces operating in two directions. In order to clarify these processes, the British sociologist Robertson had popularised the term `Glocalisation' — a term which neatly combines the two forces (global and local) and shows how they are mutually influencing each other.

This offers the possibility to trace the diverse trends into a global picture.

Of course, there are several conceivable combinations - all of them reflecting the complexity of the situation. This leads to the observation that the mutually influencing forces can be seen to differ within the process of globalisation. The force and trends of, for example, climate change, information, and sport are clearly defined and visible. But this will not be the case in an area such as culture and certainly not in education.

I will confine myself however to a few hypotheses which are generally accepted by common consent and which are described in the literature. I will confine myself to the area of education as a trend within globalisation. Therefore I will focus on those lines which are most clear –that is the forces of influence which operate from the higher to the lower level. After this description I will continue with the following questions: to what extent does the process of globalisation have a direct effect upon the field of education? What is the influence of certain civilisations on our education system? To what extent is the European Union influencing our education? In which fields is resistance being offered the trends outlined above and which operate from the higher to the lower level?

OBSERVATIONS

On a worldwide scale:

The following question then arises: in which way are we confronted with the influence of the globalisation process on our field of work, a question which relates to the impact of the Free Market on education and the relationship between education in its own right and education as a process of economic investment?

The following global trends can be observed:

(a) The priority given over competition versus cooperation

(b) The priority given to higher education and innovation within the field of competition

(c) The priority given to mathematics, science and technical skills

(d) An emerging market of tests and indicators

(e) The call for privatisation and less power for the central State

(f) The tendency for uniformity within the field of certificates

(g) The adoption of an international baccalaureate system of higher education (bachelor, master, subdegrees)

(h) A classification system which allows comparison of educational systems (ISCED)

On the level of Civilisation

An analysis of the impact of the most important civilisations reveals the following observations[1]:

(a) The priority given to science, maths and technical skills

(b) The use of English as a world language

(c) A focus on the group rather than on the, individual

(d) High demands and expectations for achievement

(e) Educational ambition as a basis for prosperity, both in the community and for the individual

On the European Level

The European Union has a growing impact on the structure and stresses the economic-oriented function of education.

It can be clearly illustrated by the following observations:

(a) The focus for a general basis curriculum and compulsory education through eight basic competencies (2007)

(b) The European Qualification Framework, which aims to introduce an compatible structure of career-directed education

(c) A uniform system of higher education through the principles agreed upon within the Bolonga process

(d) The introduction of European indicators and benchmarks

(e) The social correction, in a typical European perspective, of the extreme elements of the Free Market system

On the Level of the Nation State

Is there, in a modern context, a viable place for the nation state and its own educational system? From the recent literature we learn that the highest pressure of resistance against the trend of globalisation emerges from the cultural system of norms and values. This is generally interpreted as a defence mechanism operating in opposition to the stronger forces which operate on the level above the Nation State. This can be interpreted as a form of psychological search for established values within the threatening forces which it sees as operating from the globalisation process.

This process of resistance is reflected in all the nation states, in various grades of operation and it comprises the following elements:

- The retention of established educational systems and curricula (cf. Maastricht Treaty),
- The rise in popularity of nationalistic political parties,

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[1] I am focusing on those civilisations which form a demographic majority in the world — especially those of China, India, The East Asiatic countries and Japan

- The care and attention paid to individual cultural inheritance,
- The call for a `canon of values' to conform to the common identity of the nation state (history of the country, literature, heroes of the country, national symbols, gastronomy...)

GLOBALISATION AND ESD

In the following paragraphs I will suggest a few principles for an approach to ESD which I think can be drawn from the various influences associated with the process of globalisation.

Complexity and the globalisation dimension

Due to the complexity of challenges which relate to sustainable development, education for sustainable development (ESD) requires a system approach. Every force is intimately linked with other (not always compatible) forces. This involves what we can characterise as an 'open system' where a change in one element has an impact on the other elements of that system. The whole becomes then more than the sum of its parts. ESD asks for a holistic approach in which we seek to define a chain-reaction process of those elements which interact and influence each other. There are many examples which teach us that we have to be careful using slogans and proposing simplistic solutions for complex challenges. The most obvious themes for ESD reside in the interaction of the four levels of globalisation which I have outlined. The vision invites us to examine carefully the chain reaction of influencing forces from the perspective of the force and reaction-force of the Nation State, the level of the European Union, the perspective of a Civilisation and from the perspective of global pressure. This does not make the task easier as it needs an extra dimension to traditional teaching.

A few examples may clarify this.

When dealing in the classroom with the piracy and hijacking of shipping off the coast off Somaliland, it requires a discussion about its origin, the reactions to this from various civilisations, about the reasons why Western countries send warships to the area, but also a discussion about the situation of the local people in Somaliland.

Another example may be the overtures China makes to certain African nations in order to exert its influence in this region; the origins, the work methods and general reaction of Africans coupled with the reaction of the former colonial powers.

Interdisciplinarity

The complexity and multidimensional aspect of ESD make it difficult, for a teacher, to consider all the dimensions associated with the SD issue. Therefore it is important that a process of teamwork has to be developed wherein the interdisciplinary nature of the task can be given a suitable framework and form. Within the school organisation, good planning will have to

ensure how, on the human level, such a collaboration can best be organised. Therefore it is evident that ESD cannot be a subject in itself but it is a synthetic activity. Various subjects can be involved in such a work but this can also be achieved through a process of project-education.

Strengthening of the Nation State

If it is more clear that within the process of Globalisation the Nation State is evolving towards a form and level that offers some sort of psychological comfort that is worthwhile to use as a starting point of those elements which are experienced within the nation state. From this starting point we can build towards a higher level of this group of lands which cooperate (the European Union for example), civilisations and the global issues.

Pedagogical and didactic stresses

From the literature dealing with the process of globalisation, certain points of interest require our attention. In the first place, it seems that in the majority of the diverse civilisations prime attention is paid to mathematics, science and technical skills within the educational process. This forms so to speak, the DNA of economic growth. It is not unthinkable that in the near future the Western countries will be left somewhat behind in terms of economic prosperity. Shouldn't we pay therefore more attention to the natural sciences and the technical aspects of ESD challenges?

We also see that often high demands and expectations for achievement are put on the pupils' and students' shoulders, but also on the adult workforce. This may explain why certain experts in the field warn of a too radical overhaul in relation to children and youth in the, as yet, rich west. Shouldn't we therefore make a case that would allow the student to learn on an ongoing basis? In such a scenario we do not have to operate in an anti-pedagogical manner. In this respect I would like to emphasize the importance of giving sufficient attention to the didactic aspects of education. In other words – a didactic in which the student is challenged to go a step further but a step which is compatible with his capacities.

A further trend is the use of English as the lingua franca of the world. In China English has been the obligatory second language for students to learn. While in India, with more than one billion inhabitants, English remains the only language of general communication. Thus it is not necessary, for example to stress Chinese as a language in secondary education. Therefore, shouldn't every student learn English as a foreign language?

And finally, the European version of the free market, with the necessary social corrections, can give a boost to the ESD project. A further study of the various civilisations might show that Latin-America is the leader in this field.

I hope these hypotheses on the process globalisation within the context of ESD can contribute to the further discussion of the place of ESD in the educational system.

ENSI as a driving force for international networking in ESD?

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A sustainable society will only be achieved through a social process of searching, learning and shaping. It is critical to organise this process in a way that allows different conceptions and interests to be contributed in a constructive manner. Therefore networking is an important part of EE and ESD (OECD 1995, Kyburz-Graber, Posch & Peter 2003, Rauch & Steiner 2006).

Environment & School Development (ENSI) is an government based network and support structure focused on innovation and research in EE and ESD. It was established in 1986 and has been active in more than 20 countries since then. The ENSI Network brings together school initiatives, school authorities, teacher training, educational research institutions and has developed partnerships with UNESCO in the framework of the UN Decade on Education for Sustainable Development and with the UNECE strategy for ESD (www.ensig.org).

The core philosophy of ENSI is the empowerment of schools (students, teachers and so on) through action research, teacher education and networking to be active partners in the concrete sustainable development locally, regionally and globally (Breiting, Mayer & Mogensen 2005, ENSI 2006, Espinet et al. 2005, Mogensen & Mayer 2005, Sleurs 2008).

In the ENSI project the tension between environmental awareness and dynamic qualities provided the background for the definition of the following dimensions of environmental education initiatives: Students should be involved with environmental issues on three levels, (1) the level of personal experience and emotional commitment; (2) the level of interdisciplinary learning and research and (3) the level of socially important action. This involvement should qualify by two criteria: (1) Students should be involved in decision-making on problem finding, on procedures and on monitoring their work; (2) Students and teachers should systematically reflect on their activities (Posch 1993).

What are networks?

In third phase of ENSI (1989-1994) the development of dynamic networks became important. *"These networks of communication are developed by teachers and students because they appear to be necessary to help them understand and influence the situation they live in. The networks are non hierarchical because they do not follow predefined routes of (generally top-*

down) influence. They are dynamic because they are limited to the demands of specific tasks as defined by the teachers and students involved. As a result, they are flexible with respect to the kinds of exchange processes and with respect to partners and duration. The essential feature of dynamic networks is the autonomous and flexi¬ble establishment of relationships to assist responsible action in the face of com¬plexity and uncertainty. Dynamic networks contradict one of the traditional assumptions of schooling: the assumption of a separation of school and society. If dyna¬mic networks develop it is difficult to say where the educational organi¬sation ends and where society and its abundance of personal and insti¬tutional relationships begin" (Posch 1993, 39).

Networks can also be seen as intermediate structures in which, among other things, the fields of autonomy and interconnectedness of structures and processes, parameters and freedoms, as well as voluntariness and obligations. Practice and sciences try to forge new paths in the formation of learning and the cooperation between people and institutions (Rauch et al., 2007).

For the development of networks in education the following aspects of networking seem paramount:

Mutual Intention and Goals: Networks orient themselves on a framework topic and goal horizons which have been agreed upon by all (Liebermann and Wood, 2003).

Trust Orientation: Mutual trust is a prerequisite in order to exchange and share knowledge and is thereby a prerequisite for learning. Networks bolster new, innovative paths (risk taking) and they can support conflict resolution (McDonald and Klein, 2003).

Voluntary Participation: Networks don't issue sanctions. Interventions can be vetoed (Boos, et al., 2000).

Principle of Exchange (Win-Win Relationship): There is the possibility for the exchange of information that can be put into effect at crrent occasions. Mutual give and take are vital. The phenomena of power and competition aren't excluded, but rather are broached and dealt with on the same level between the center and periphery (OECD, 2003).

Steering platform: The matter is not an occasional interaction relationship but rather institutionalized configurations. Networks have to be coordinated and maintained in order to support exchange processes, cooperation and learning (Dobischat and Düsseldorf et al., 2006).

Synergy: Networks make synergy effects possible through structural organization, offering an alternative to classical rationalizing strategies which are characterized by the dismantling of structures (Schäffter, 2006).

Learning: Networks are support systems based on reciprocity. Those involved can exchange views and information, and cooperate within the scope of mutual concerns. They learn from and with each other (Czerwanski et al., 2002).

Per Dalin's (1999) consideration of functions of networks in education might form an important theoretical basis for the formation networks also within ENSI. According to them, networks have an *informative* function which becomes visible in direct exchange of practice knowledge for instruction and school and as a bridge between practice and knowledge. Through networking further opportunities for learning and competence development (professionalization processes) are encouraged by the members, which establish *the learning function.* Trust is the prerequisite for cooperation within a network. It is the bias for the *psychological function* of a network which encourages and strengthens individuals. In a fourth, so called *political function* of networks, the assertiveness for matters in education increases, following the motto "together we achieve more".

ESD based upon ENSI

Like human rights, education for sustainable development may be regarded as a "regulative idea" which inspires social learning and shaping processes. Regulative ideas help us to organise our knowledge and to link it systematically with normative elements. Regulative ideas serve as heuristic structures for reflection. They give direction to research- and learning processes and in this way prevent the individual from groping about in the dark without orientation or appropriate context. Regulative ideas can also be understood as pre-concepts without which no reasonable question can be asked and no problem identified. Therefore, uncertainty is a constituent element of this regulative idea without which consensus would be impossible. In terms of sustainability, this implies that the contradictions, moral dilemmas and conflicting targets inherent in this vision need to be constantly re-negotiated in a process of discourse between participants in each and every concrete situation. The consensus which is expressed in the idea of sustainable development is not static, but one that needs to be re-established time and again in given situations and between different groups. The tentative and emerging nature of the idea can delineate an extremely creative, manifold and dynamic field, which is nevertheless oriented in a particular direction (Rauch 2004).

The idea that education for sustainability can be a pre-concept or regulative idea goes hand in hand with a responsiveness in many social areas. Responsiveness, however, does not suggest a complete alignment of the idea of sustainability to those to whom it is addressed; rather, it looks for overlaps with visions and objectives which already exist. For school education this means, for example, that sustainable development must tie in with existing conceptions of teaching, school life and the relation of the school and its environment. Thus, dealing with the

topic becomes appealing and worthwhile from the inner perspective of a school, as it does not only imply new, additional tasks, but also results in solutions for current problems.

Furthermore, the interdisciplinary nature as well as the present and future relevance of the sustainability debate, with all its inherent dilemmas, uncertainties and confusions, may constitute fertile ground for educational innovation. It is of utmost importance to address the twofold challenge of the vast complexity which results from sustainability and related uncertainties in order to retain a capacity for action without lapsing into simplistic dogmas. While on the one hand sustainability issues are used as a vehicle for innovation by these initiatives, they are also meant to trigger concrete sustainable social development processes. (Rauch, 2002)

ENSI as driving force?

ENSI has developed as a platform for exchange and learning on different levels, such as countries, regions, schools, teachers and researchers. This platform fosters innovative and sustainable ideas like (1) the starting point with the inter-relation of the two contradicting elements dynamic qualities (economic sphere) and environmental awareness (ecological sphere); (2) The development of quality criteria for eco-schools; (3) ENSI tries to connect EE/ESD with school development, networking and powerful developments in society; (4) The generation of action research learning communities by teachers and academics; (5) The development and publication of many examples of good practice nationally and internationally. All in all ENSI got influences on other programms in EE and ESD (i.e. MUVIN in Scandinavia, BLK 21 in Germany).

The following aspects I see as challenges beyond the financial registration in the years to come. Dynamic networks and school development is still at the beginning. ENSI developed quite radical concepts which are not easy to implement but worth while to work on it. At least in central Europe the development of standards and external testing could be a danger of deprofessionalization of teachers and school development.

Ideas for the future might be a step by step extension into Asia, Southamerica and Africa to bring in fresh ideas from other cultures. More exchange and networking at the political level within ENSI might strengthen the network and foster implementation processes. Within countries alliances and partnerships with other projects should facilitate mainstreaming of ESD (i.e. in Austria a co-operation between the Ecologizing School Project with the Science Education network IMST on theme Energy). Finally focussing on economic issues (i.e. consumer education) might refer to ENSI's basic conception in the first years within an new context and might take the economic crisis as a chance for sustainable learning and living....

Report on Education for Sustainable Development Projects in Asia

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The Asia region has achieved the most rapid economic growth world-wide over the last 40 years and at present accounts for 38% of world income (Sachs, 2008). The region reached an average 3.31% GDP per capita growth rate which is more than the global average of 1.93% (The World Bank, 2008). Consequentially, this region faces urgent environmental problems especially regarding climate change issues due to increasing CO_2 emissions and energy consumption. Meanwhile, 20% of the world youth population live in Asia. This group is specifically targeted for Decade of Education for Sustainable Development (DESD) along with diverse stakeholders in consideration of their potential empowerment in addressing climate change issues (UNESCO, 2009). UNESCO also stressed the significance of capacity development for this youth group to enable them to adapt and mitigate climate change and the urgent necessity of education to support them (*Ibid.,* 2009).

To respond to the international/regional calls for tackling climate change and youth education above, the Capacity Development and Education (CDE) Project at the Institute for Global Environmental Strategies (IGES) in Japan, has conducted research on Education for Sustainable Development (ESD) in the Asia region to seek a way to create balance between rapid economic growth and environmental sustainability by using educational tools. The ultimate goal of the CDE Project activities is to provide critical recommendations to political decision-makers and experts to enable them to make effective policies and to detail practical opportunities to encourage practitioners to engage in ESD. As examples of ESD research projects conducted by CDE Project at IGES last fiscal year (April 2008 – March 2009), two case studies on ESD in Asia are outlined as follows (Please see Choi et al., 2009, and; see also Choi, and Kipp, 2009 for further details of the following case studies in China and Southeast Asia respectively).

Education for Sustainable Development in China

China has recently celebrated its thirtieth anniversary of "Reform and Opening-up Policy" which was an ideological foundation transformation that eventually led to significant economic growth since the political revolution in 1978. At the same time, it is notable that the Chinese government has exceeded environmental policy goals since the early 2000s which included Environmental Education (EE) for Sustainable Development (SD) and ESD. The visible economic growth during this time consequently resulted in serious environmental problems which not only caused national challenges but also impacted on adjacent countries such as Japan and Republic of Korea. Therefore, it was an appropriate time to examine the current status and obstacles of ESD policy practice in China to provide its future orientation.

From a consultation meeting with Chinese ESD experts and practitioners as a part of the regional workshop in Northeast Asia on the 26th September, 2008 (see Choi, 2009a for details), five ESD programmes were selected and examined in cooperation with Chinese ESD researchers: "Project Hope", "UNESCO China EPD-ESD Project", "Green School Program", "Project of Environmental Educators' Initiative" and "UNU-RCE Activities in China".

The case analysis indicated that ESD in China has developed dramatically over the last decade. However, it is still at the preliminary stage, or can be called an experimenting stage as the policy of ESD at the state level is still on the way. For instance, ESD documents issued by the Ministry of Environment are rarely found besides the 2003 issued "Implementation Guidelines on Environmental Education for Primary and Secondary Schools", although it was firstly called for in the 1994 "China's Agenda 21". Nevertheless, it is also noticeable that a number of important projects on ESD have been conducted in China with the help of international organisations across the country. These projects spatially cover a large portion of the country, especially in the eastern advanced areas, and they generally seem as an extension from EE to the inclusion of social and economic components, so including ESD. In addition, there was a distinguished gap of ESD development and implementation level between east region and west region in China. For instance, the east part of China is relatively more developed economically than the west, especially the western rural areas which are one of the poorest areas in China. On the contrary, in the east part of China, the governments, enterprises, and the general public have higher level of ESD, so as stronger environmental consciousness. Eco-city movement is more successful in these regions, including all the state level acknowledged eco-city/eco-county/eco-district (Ministry of Environmental Protection of China, 2009).

From the case studies, some key characteristics of ESD in China were found across the examples. First, many of the EE programs are incorporating ESD subjects along with basic education. In fact, China is extending the guidelines and requirements from EE to cover ESD. For instance, as Education for All (EFA) lies at the heart of the effort to achieve the DESD objectives. At the same time as shown in "the Project Hope in China", ESD has been achieving great successes in promoting 9-year compulsory education and illiteracy elimination within a development of the EE concept. Second, it is noticeable that ESD is often understood within a

narrow sense. For instance, it was found that ESD was understood across the examined five cases as a simple concept of changed behaviours and lifestyle teaching which indicate that Chinese people are still living at a low standard. As additional status of ESD in China, thirdly, governmental attentions and funding are significant in developing ESD at a local level as China has a central governing system that powerfully controls not only national curriculum but also the social education system. Finally, insufficient human resource to teach the concept of ESD and its implementation in actual fields is also noticeable because ESD is relatively new in China.

From the main findings of the case studies, some key issues emerged as the basis for recommendations for ESD researchers and policy-decision makers. For researchers, a) it is needed to localise the concept of ESD into EE for SD within the status of political, economical and cultural contexts in China based on research evidence in order to enable people to understand and transform concepts into actual practice;   b) In-depth research is also needed to provide adequate and specific kinds of knowledge which considers different educational levels for national curriculum reforms for EE for SD and ESD within a national framework, and; c) developing capacity development programmes and provide training courses for practitioners and governmental officers which reflect the current situation and challenges of EE for SD and ESD are urgently needed. For policy decision-makers, a) In view of the different development levels in different areas of China, it should be important to formulate policies or guidelines of ESD to implement in different areas given the unique local context and conditions. For example, for the poor regions, basic education is the most important task. However, it should be possible to include some of the principles and information on sustainable development in the curriculum and improve quality of and access to basic education in line with the basic thrusts of ESD, and; b) It is urgently needed to support adequate funding not only to researchers to conduct in-depth research which can collect concrete evidence for developing practical instructional resources for ESD teaching/training programmes but also to practitioners to promote actual implementation at a local level.

A Case Study on ESD in Southeast Asia
Southeast Asia (SEA) is one of vulnerable regions to climate change because of the climate change-induced sea level rises and its other consequential environmental calamities. Within a focus on climate change and youth as explained above, a case study framework was designed including consideration of the specific economic status of each country and the indigenous contexts of SEA countries.

The ultimate goal of this research project is to add to the understanding of ESD in SEA by giving concrete examples and insights into critical factors at the local level for ESD. Therefore,

the research objectives were a) contributing to the DESD by providing a local level perspective of ESD policy and practice in SEA; b) adding to the understanding of how climate change in being addressed in education in SEA, in particular for youth, and; c) supporting ESD policy in SEA, in particular through the ASEAN Environmental Education Action Plan 2008-2012 by providing insight into critical factors for promoting ESD. In consideration of the regional issues on the balance between economic growth and environmental sustainability, two key questions were established: What are the critical factors promoting good practice of ESD programmes at the local level?, and What do we need to consider in implementation of ESD programmes within the indigenous learning contexts in SEA countries?

To find answers, *Climate and Youth ESD programmes* were examined in three selected countries: Singapore, Thailand and Vietnam. Those cases were selected in relation to the main concepts of the study. This research employed qualitative research methods using in-depth individual & group interviews and observations in the three countries (25 August – 11 September, 2008). A consultation meeting inclusive of diverse regional stakeholders (such as from UN/international organizations and SEA countries) was also organised (17-18 November, 2008 in Bangkok; see Choi, 2009b for the consultation meeting report) to avoid partiality and bias in data analysis and conclusions.

From data analysis, a structural framework of good practice of ESD programmes at a local level consisting of three components was developed based on the theory of communities of practice (Wenger, 1998) and entitled "Joint Enterprise", "Mutual Engagement" and "Shared Repertoire". Despite diverse political, economic and cultural contexts influencing ESD in SEA, these three components were commonly identified as a fundamental implementation framework in actual practice. Regarding the component "Joint Enterprise", community membership, human resource development and a diverse methods approach including life-skills and local knowledge learning are the critical conditions for engaging in ESD. For "Mutual Engagement" of people and organisations in ESD, a positive cooperative working atmosphere joined in by diverse stakeholders is critical. One of the noticeable components of this structural framework of ESD programmes is the final component "Shared Repertoire". Although there has been a lack of resources in ESD along with a relatively slow process of being mainstreamed in SEA thus far, it was possible to find that people familiar with ESD and EE for SD share their rich repertoire via active communication and by increasing environmental empowerment. In particular, communicative skills and building a resource pool to show accomplishments which people and organisations can access easily and share are critical to facilitate active communication amongst individuals and organisations engaged in ESD activities.

Meanwhile, ESD in SEA has high level recognition in policy and is gaining the attention of researchers and educators, but is still an ambiguous concept for many in policy and in practice.

In particular, ESD is conceptualised globally with very broad and encompassing coverage and with links to other educational movements, but this has resulted in a gap between high level discourse and actual implementation in that global vision of ESD at the local level. Therefore, the case study indicates that a major challenge is making climate change locally relevant with two-folds: a) locally relevant materials, and b) finding space in the curriculum to utilise the materials they could find. In addition, in terms of regional cooperation and collaboration climate change was seen as an excellent issue to focus on for transboundary benefits, and to share resources, especially in youth oriented ESD programmes. Youth seemed to be a group that was keenly aware of the issue, often through ICT and new media rather than formal education. Practitioners, though clearly aware, face major challenges of finding reliable and locally relevant materials of a suitable quality and finding space in the curriculum among core and required subjects. But awareness and action can be as far apart as the gap between policy and practitioner.

From the case study, it was possible to find key messages to three main ESD groups targeted in this research. Firstly, ESD practitioners need greater understanding of the significance of an active participatory approach in delivering ESD which allows youth to understand and actively engage in ESD programmes. In particular, it would be critical to increase awareness of environmental empowerment to address climate change with a realistic and tangible approach with methods utilising local knowledge and languages. Secondly, researchers may consider development of climate change and youth oriented ESD research which can be easily adopted and accessed by practitioners. In doing so, researchers need greater awareness of the significance of structuring practical research evidence into ESD programmes. Finally, for policy decision-makers, it is needed to formulate efficient ESD strategic policy which not only considers the national needs for sustainable development but also reflects local demands and unique contexts which enable it to reach the local level in alignment with the goals of central government through a dedicated engagement platform with stakeholder groups. In doing so, it is necessary to open a gate to listen to actual voices from ESD practitioners working in schools and NGOs.

Learning environment – a new term?

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Need for conceptual definitions
Learning Environment is a central and commonly or even most often used in current educational debates. LE is also commonly used as a framework for development work. However, at the same time it is very fuzzy concept, and therefore concrete definitions are needed to clarify discussion. Also a deeper understanding about the nature of Learning Environments is needed.

LE have also different meanings for different people. For example an architect usually define learning environment as "a building", while ICT-oriented teachers and trainers talk about "Web based or virtual learning environments". Therefore some kind of common language and terminology is needed.

There is also a need for a deeper analysis of learning theories behind learning environments, because theoretical background of LE's is seldom discussed, or simply linked to constructivism.

Definitions of the learning environment
From searches in the literature it would seem that the concept of the learning environment has been around since the 1930s (Goh & Fraser 1998), focusing initially on classroom teaching. Malcolm Knowles used the expression at the end of the 1960s, particularly in the area of adult education, when he stressed how important it was for the social and physical learning environment to be suitable for adult learners (Knowles 1970). With the use of information and communication technologies in teaching, the term has been mentioned since the mid-1980s, mainly in the form virtual or web based learning environment. In the literature in Finnish the following definition has gained currency:

> *"A learning environment is a place, space, community or working practice, whose purpose it is to foster learning" (Manninen & Pesonen 1997).*

In Finnish basic education learning environment is defined in a rather similar way:
> *"The learning environment refers to the entirety of the learning related physical environment, psychological factors and social relationships. In this setting study and l earning take place."* (Finnish National Core Curriculum for Basic Education 2004, p. 16).

In the literature in English the most commonly used definition is Wilson's, based on the constructive conception of learning (paraphrased):

> *A learning environment is a place or community where people have access to various resources they can use to be able to understand different things and develop meaningful solutions to different problems* (Wilson 1996, p.3).

An essential feature of these definitions is that the learning environment can be seen not only as a physical or virtual place or space but also as a human community forming a supportive, interactive network. The context of study is thus broadened: it is no longer just the environment of a traditional educational institution but it now forms a flexible entity connecting with work and leisure time.

There is also very broad consensus in the literature with respect to the notion that learning environments always have a physical, social (intellectual/psychological), technological and didactic dimension (e.g. Pieters et al 1990; Manninen & Pesonen 1997). The social dimension of a learning environment refers, for example, to the group's role and interaction, as well as an atmosphere of mutual respect, cooperation and enjoyment. In multicultural communities the cultural dimension has taken its place alongside the social and psychological one (Hiemstra 1991). Here the aim is to take account of the special features of different nationalities or subcultures in establishing the atmosphere in a learning environment.

The physical atmosphere is typified by the layout of desks and chairs, the lighting, the comfort of the seats, and the significance of the physical environment generally. The teaching applications reliant on various technical and telematic tools demonstrate the technological dimension, whose criteria include user-friendliness of the tools, their reliability, their beneficial nature, their speed and their human-orientedness. The didactic atmosphere in the learning environment refers to the didactic approach on which the instruction and learning relies. Any environment contains the first three elements, but only the didactic dimension makes an environment a learning environment. The living room becomes a learning environment if being there is associated with didactic objectives that support learning.

What is the role of environment in learning?

What distinguishes the learning environment from class and course-based teaching is that in the learning environment:

- there is emphasis on the learner's own activeness and self-directed study;
- study takes place at least partly in either a simulated or an authentic real world situation;
- the students have an opportunity to be directly interactive with the subject of study;
- the planning of teaching is problem-oriented rather than subject-oriented;
- study is an integrated, longish process rather than a series of short lessons;
- the student is aided by networks of different persons offering support, mentors and experts;
- the teacher's role changes from that of someone who imparts knowledge to that of an organizer, a person offering support and a planner of the learning environment.

It is thus very much about didactic changes, where the focus is on student centered, problem-based, supportive learning, social interaction, cooperative and collaborative learning, and sometimes moving the learning environment or networking outside the classroom or educational institution. Another matter for consideration is what added value or support fostering learning the environment offers the learner. How, for example, do children spontaneously and independently learn different things 'naturally', and what is the importance and role of the environment in such learning processes?

ESD and Learning Environments?

Eduaction for sustainable development and environmental awareness is a typical cross-curricular theme. For example the Finnish National core curriculum for basic education (2004) includes seven cross-curricular themes, including "responsibility for the environment, well-being, and a sustainable future".

The challenge for teachers and schools is that these integrated objectives such as active citizenship, sustainable development etc. can't be taught using traditional teacher centered school methods. Obvious solution is to start thinking about learning from the point of view of Learning Environment.

There are subsequent changes in school. First of all, teachers should stop teaching alone and have more team work and cooperation. Instead of isolated subjects (maths, biology…) there should be integration of subjects, and more use of problem based learning. Traditional 45 minute lessons should be replaced by learning projects and processes, and learning taken out from classrooms into real life contexts. This will encourage and require use of networks, partnerships, and co-operation with real life actors.

Example: ENO-programme

A good example of learning environment approach is ENO - Environment Online (www.enoprogramme.org). It is a global web school for environmental awareness and sustainable development where environmental themes are studied throughout the school year. The contents come from the participants. Even though ENO is a web school, it is not technology dominated, since ICT is used only for purposes of international communication and sharing of

materials. Social, freely available media such as Google Doc's are used effectively, which enables learner focused international cooperation. The network has over 2000 schools in 122.
The goals are:

- To deepen environmental awareness
- To adapt a new way of learning (project work)
- To support new skills in ICT
- To add global perspective and internationality in education
- To adapt ENO as a subject in the curriculum
- To support sustainable development
- To struggle against the Digital Divide (ENO Twinning Programme).

OECD/CERI[1] Innovative Learning Environments project

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The Innovative Learning Environments project has grown out of the major CERI (Centre work on Schooling for Tomorrow). The Schooling for Tomorrow scenarios have proved to be an effective vehicle for raising awareness about alternative ways in which learning systems for young people might be organised in the future. But they are much more targeted at systems than the 'black box' of learning, learners and teaching such that demand has grown within Schooling for Tomorrow to focus more directly on learning. This led to an intensive exploratory study in Mexico culminating in the Merida conference in June 2006. That study combined the close study of learning innovation in concrete environments with broader reflection from a range of disciplines and countries, creating synergies between them.

This new project called Innovative Learning Environements focus on the organisation of learning. In that sense, it is focused on research and concrete innovations and aims to inform and inspire policy reform agenda. In other words, the OECD/CERI *Innovative Learning Environments* (ILE) project is focused on how young people learn and under which conditions and dynamics they can learn better. This means identifying inspiring practice to help enrich mainstream education for children and young people. The project aims to inform educational reform by generating evidence from the learning sciences and providing innovative examples from the field with which to help the positive transformation of teaching and learning practices in today's schools.

There are three main inter-related project components: i) the *Analytical Strand,* ii) the *Empirical Strand*, and iii) the *Policy Strand:*

- The first (i) is generating a detailed analysis of the current state of the knowledge on learning. The analytical work stands as of value in its own right and is serving to inform the questions and instruments of the Empirical Strand,
- This second component (ii) is gathering and analysing concrete cases of innovative learning environments – their processes and contexts as well as how they

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1 Centre for Educational Research and Innovation (CERI); Directorate for Education, Organisation for Economic Co-operation and Development (OECD).

influence learning outcomes and the conditions of their sustainability and dissemination.

- (iii) the "Policy Strand": the analytical and empirical work will then feed into a deeper reflection on how new forms of learning environment can be more widely generalised, connecting this to policy experiences, conditions and already-existing policy approaches to fostering effective learning environments.

Hence, the project has been designed so that each element – innovation, research, and policy – will closely inform the others. For instance, the research tools used for the project's Inventory and the Observatory (defined below) are being based on key findings of the learning sciences as brought together in the analytical work; these together in turn will help launch the policy reflection.

In this paper, only the Analytical and Empirical strands will be discussed. The Policy Strand has not been launched yet, but the research question underlying the policy strand may be summarised as: What are the policy dynamics, cultures and frameworks in education which support innovation for learning in the 21st century? What new forms of learning organisation are emerging? How can these findings feed into mainstream discussion among educational leaders, decision-makers, often preoccupied with immediate reform priorities? The policy strand will in that sense enrich the reform debate and tackle issues such as scalability, sustainability and implications for the surrounding school systems

The Analytical Strand

As concerns the Analytical Strand, there is a new analytical report in preparation, intended to be a leading publication. It seeks to provide a "holistic" picture of the learning process based on authoritative research reviews. Different perspectives on learning will be presented and the connections between them will be drawn, written in a way that is geared towards educational leaders and policy-makers. Each chapter is being written by a leading researcher, summarizing the latest research findings from one particular perspective on the learning process. In the light of these findings, each chapter address two questions. First, how do students learn optimally? Second, how can teachers and schools best provide a favourable learning environment for learning?
Based on the different chapters, concluding transversal analyses will arrive at an evidence-informed basis for moving towards learning environments which respond to these research findings. Each chapter is 5 000-7 000 words in length. The final draft with all chapters is expected around mid-year 2009 and the final publication will be ready by the end of 2009-early 2010.

The Empirical Strand

The aim of this strand is to gather and analyse concrete cases of innovative learning environments from the field and how they can inspire the positive transformation of teaching and learning practices in today's schools.

We are looking for examples of settings where learning takes place as an active process, fostering in learners the capability to apply knowledge and skills flexibly and creatively in a variety of different contexts. We are calling these settings **"Innovative Learning Environments" (ILEs)** and they are defined by CERI as settings in which all the following conditions are met:

- There is a *common approach to the content and organisation of learning at the micro level* by those with pedagogical and leadership responsibilities within these learning environments, i.e. they have a distinctive approach to the ways that learners and teaching resources, mediated by different "technologies" and facilities, inter-relate.
- They are intentional departures from the large body of general or vocational education in their specific aims and organisation of learning, in order to respond better to the needs of the learners they are aimed at – i.e. they are innovative.
- They aim at a *broad set of the learning and educational needs of the learners,* rather than catering for very specific types of knowledge or capabilities. They address the range of cognitive, meta-cognitive and socio-emotional learner development whatever their specific curriculum focus.
- They are learning organisations, formally or informally *evaluating their own practice* for continual improvement.

In addition, for the purposes of this project, ILEs are defined as settings which:

- *Serve the learning needs of children and adolescents (*approximately aged 3 to 19 or some band within that): they may cater exclusively for young people within this age range or for mixed-age groups where either younger children or older adults are also involved.
- They have *lessons for mainstream provision:* they do not depend on such high fees or generous resourcing that they are only relevant for the very wealthy.
- Though defined in terms of learning and teaching at the micro level, they are not so small-scale as to depend on the commitment of one person or a very tiny group - *they rely on more than the contribution of a specific individual(s).*

Two further clarifications can usefully be made. First, the focus and terminology is deliberately on learning environments for school-age learners, **rather than "innovative schools",** to emphasise that the innovations we are interested in are at the micro level of teaching and

learning. We recognise that many of these will in fact be found within schools or networks of schools. However: i) they will not necessarily all be found in mainstream education but also in learning centres, community- or ICT-based programmes, enterprises, specialist academies for the arts or sport etc.; ii) examples of schools which are innovating in their management or resource use may be maintaining traditional teaching and learning relationships and so would not qualify.

Second, though the ILEs we are interested in address the broad educational needs of the learners within them, they do not necessarily aim at, nor are relevant for, all school-age learners. Learning settings for **specific subgroups** of students *(e.g.* indigenous/native learners, migrants, the gifted or those with learning difficulties) often provide highly distinctive learning environments which are especially effective at meeting the needs of these groups. These cases come within our sphere of interest: they aim at important sub-groups of the school-age population and they are especially relevant when they work in ways that are potentially transferable or adaptable for other groups of students.

The Empirical Strand will identify concrete examples of innovative learning environments from OECD countries and (when possible and relevant) from other places too. Initially, there will be a broad compilation of cases (the **"Universe"** of ILEs). Those cases with particular interest will be reported in more depth and then constitute the **"Inventory"**. The **Inventory** (with a more limited number - eventually 35-70 –) with bring more detailed information especially regarding the organisation of learning and how this is innovative within its own system. These will be drawn from each participating country/region/network, and will be supplemented by others identified by the project team. Further analysis of the policy context of the Inventory cases will subsequently be conducted. Additionally, 10 to 12 cases will be selected by the project team for detailed, multi-method case study analysis, focusing on the micro-processes of learning and its organisation, relationships with outcomes, and wider context. This last group will be called the **"Observatory".**
Not all cases proposed by participating systems, or suggested by other networks or organisations, or identified by the project team will enter the Universe: in order to be relevant, the cases must all as a minimum fit the criteria outlined above and they must be able to show this by providing a profile description corresponding to the proforma template, especially regarding the organisation of learning.

Participation in the Project
The successful implementation of the project will depend on the active participation of countries/regions, institutions and foundations concerned with improving today's schools as

well as that of researchers, innovators and practitioners. Each of these stakeholders is encouraged to enrich the work of the project by sharing their own experience.
More specifically, the different groups of stakeholders are invited to play a specific role in the project:

As a country/region. The active involvement of as many countries/regions as possible from the outset is essential for our project. All countries are invited to participate in the project while the implementation of the work will be facilitated by certain countries who take a lead role. Participation includes proposing potential cases; identifying researchers, innovators and practitioners who might play a wider role in the project; providing detailed report back on cases featuring in the project's "universe" and "inventory"; engaging in the policy discussion about systemic implementation; and participating in different project meetings, seminars and conferences.

Those countries that would like to play a lead role will host certain events, such as advisory group meetings or conferences, and contribute to the international overhead costs of the project, both at OECD/CERI and with the international experts involved.
 To date, (26 April 2009), the following 16 countries and regions have joined the project: Australia (Victoria), Austria, Canada (Alberta), Chile, Denmark, Finland, Germany (Thüringen), Hungary, Mexico (Nuevo León and through CONAFE), Norway, Portugal, Slovenia, Switzerland (Cantons of Bern and Ticino), United Kingdom (Scotland). We are in active contact with others and we expect this list to grow yet.

To participate in the Innovative Learning Environments project does not involve making a direct financial contribution to the OECD, unless the country, region or organisation wishes to play a leading role. However, it is expected to cover the costs of engagement – bringing together the necessary expertise in their own system, preparation of documents, and participation in the main international seminars and meetings. Those countries which would like to play a **lead role** beyond these forms of participation just described may do so by hosting certain events, such as advisory group meetings or conferences, or they may make a direct contribution to the international overhead costs of the project. These will be warmly welcomed and will allow the contributing system to be internationally visible as taking a lead in this key area of reform.

You can also participate in the project as an **institution or foundation.** Institutions and foundations sharing our belief that today's education system is not prepared for a knowledge society, and pursuing the same goal of transforming today's schools into communities of

thinking and learning, are invited to become part of our network on innovative learning environments. We welcome them to share their expertise with us and to support the project. Finally, you can also participate in the project as an **individual expert.** Are you a researcher occupied with the analysis of teaching and learning? Are you an innovator who promotes new and exciting learning environments for the 21st century? Are you a practitioner organising your classroom, school or learning centre differently from "traditional" practice? Then our project might be of interest for you and you might be of interest to us! The expertise of innovators and practitioners is very welcome as part of our larger network on learning environments. Providing interesting cases and initiatives from the field directly to us is another way of getting actively involved.

A participating system in the ILE project is thus: engaging with international experts, innovators and reformers who are similarly in search of 21st century learning arrangements. It means to address innovations in one's own system and in others, and to engage with leading researchers with a shared focus on re-shaping schooling. It will mean to help shape the reform agenda in one's own system by bringing into play a rich set of international findings and networks.

For further information, please write to learning.environments@oecd.org or contact Adriana Ortega-Orozco Adriana.ORTEGAOROZCO@oecd.org

Learning environment ICT - Empowering pupils for a sustainable future

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Introduction

There is wide agreement that pupil participation is fundamental to the development of pupils' competencies in ESD. The aim of the workshop ' Learning environment ICT – Empowering pupils for a sustainable future' was to explore how ICT can be used as a participatory tool in ESD. As an example of an ICT tool specifically developed for this purpose, *CO$_2$nnect – CO$_2$ on the way to school* was presented to the participants.

CO$_2$nnect- CO$_2$ on the way to school is developed as part of the Comenius network *SUPPORT-Partnership and Participation for a Sustainable tomorrow-[1]* , consisting of more than 40 partners and members from over 20 countries. The long-term purpose of CO$_2$nnect is to improve the understanding and practice of ESD. To achieve this, schools are offered an international, internet-based school activity in which schools, researchers and local decision-makers cooperate on the topic of CO$_2$ emissions from local transport. The CO$_2$nnect website is free and open for everyone to use. CO$_2$nnect activities are carried out through the following steps:

The 10 steps of carrying out CO$_2$nnect

1. *Plan and prepare for the campaign (teachers, preferably together with pupils) Get familiar with the website, approach and activities. Make a school/class plan for your work with the campaign (see also Help sheets for hints about methods). Find local partners or school partners and plan how you will cooperate.*
2. *Sign up to participate.*
3. *Introduce topics of climate change, CO$_2$, and school transport.*
4. *Collect data on distance to school and means of transportation and enter it into the international database.*
5. *Complete a short online questionnaire on climate- and transport issues.*

1 SUPPORT website: http://support-edu.org/

6. Analyse and discuss your results; compare your CO_2 emissions from transport with that of other schools and countries (see also suggested Questions for discussion).

7. We encourage you to work closely with local authorities, parents, businesses, organisations or other stakeholders during the project. You could present and discuss your findings. Then explore together how the local transportation systems could be made more sustainable. What policies or programmes does your school or community already have for transport and climate gas emissions?

8. Develop ideas for reducing climate emissions from transport. Upload your climate idea and photos from your work.

9. Submit your project work to an international school competition (optional).

10. Evaluate the campaign and become a SUPPORT school (teachers, optional).
(Source: http://www.co2nnect.org/what/)

For more information about CO₂nnect, including participants, intended learning outcomes etc., please see www.CO2nnect.org

Group work, discussions and outcome

More than 25 people, including teachers, researchers and participants from local authorities, participated in the workshop. They formed three working groups. The handed out questions for the group discussion were: 1) How are the opportunities for carrying out the activities in CO₂nnect in your home country, and what might be the challenges/limitations? And 2) In which ways and to which extent can ICT facilitate the development of learning environments supportive of ESD?

Rather than starting with the handed out questions, the groups felt it was neccesary to start discussing the working title of the workshop " Empowering pupils for a sustainable future". This led to a fruitful debate about what "empowerment" means in the context of education. The following were expressed by the various participants: "Empowerment is about… stimulating change on a personal and a collective level", "development of personality", "action in a personal and social sense", "democratic structures, social structures, and social and global responsibility", "education involving local community: 'think globally and act locally'"," contextual learning". In essense, we can argue that it is the same keywords that is commonly used to describe ESD. Hence, the aim of empowering students is at the core of ESD

In connection with this discussion on "empowering pupils" some also pointed to a fundamental challenge : Do we want to "empower" individual pupils or must we as educators also take on to the challenge of 'transforming' the educational system. The idea behind the need for a "transformative pedagogy" is one of the main dispute around the UN Decade for Sustainable

Education (2005 – 2014). There were some disagreements in the discussion on how far we as educators should be involved in this discussion as it will relate to different political viewpoints. But most of the discussants could agree on the need to make pupils aware of the deep value problems involved in efforts to work for a "transformation of education". Therefore, most of the ideas and suggestions for empowering pupils must take on the system challenges in education.

Furthermore, the participants tried to capture certain "ingredients" for such (empowering) learning/education. "Empowering education includes… Collaboration and participation in real life issues , empowering education can be viewed as cyclical: participation can empower, but you have to be empowered to participate …, teacher and students must collaborate ,Requires motivation/passion (education must be meaningful for the individual and instill self-confidence),Pupils' own capacity must be used as a starting point, it is about development of competencies , for the teachers to it aquires team development and support, and one must dare to 'loose control'. Again, the participants views on what is needed to empower pupils mirrors the characteristics of ESD.

Taking with us the thoughts on empowerment as fundamental to ESD, we moved on to discuss the two questions. 1) How are the opportunities for carrying out the activities in CO2nnect in your home country, and what might be the challenges/limitations? And 2) In which ways and to which extent can ICT facilitate the development of learning environments supportive of ESD?

There seemed to be an overall consensus that there were numerous opportunities to carry out a project like CO2nnect in a class. Still, the well-known challenge with overloaded- curriculua in combination with most countries exam-driven culture made any ESD project challenging for teachers. Many of the teacher participants communicated that they felt the need to be empowered themselves, in order to be good 'guides' for their students. To summarise, the group felt that ESD lacked legitimazy in their society and many felt they were not given sufficient support in their schools.

The discussion on the question relating to whether ICT can facilitate the development of learning environments supportive of ESD, was more optimistic. The partcipants belived that ICT, as demonstrated by CO₂nnect, could facilitate an empowering learning environment. CO₂nnect enables pupils to work with others, in a real setting - with real issues, and propose climate ideas. Young people get an opportunity to participate in democratic processes through collaboration with local authorities. partnering with authorities, parents, companies and others.The activities encourages project work and cross-curricular teaching. The groups identified that advantages of using ICT in ESD was: motivating students (young people often enjoy working on the web), ICT kan help pupils find their own knowledge (also outside of the

school), and ICT can support the 'strategy level' in ESD(collaboration between schools and other stakeholders as seen in CO_2nnect).

A challenge for schools that was mentioned was the current comtetetive maket in ICT (i.e. multitude of ICT tools offered to schools, e.g. ecological footprint calculators). On reflection, it would be useful if the participants had a change to check out various web tools themselves, especially CO_2nnect, rather than it just being presented on a PowerPoint.

Conclusion

The aim of the workshop was to explore how ICT can be used as a participatory tool in ESD. As a starting point for discussion, the ICT tool CO_2nnect- CO_2 on the way to school was presented.

 If ICT are to be empowering (which the participants agreed was crucial for ESD), the ICT tool must facilitate pupil participation in real issues of sustainability. Only then can the education be contextual and meaningful for pupils and teachers. Collaboration between stakeholders outside of the school is essential if the pupils are to be included in local democratic processes. As CO_2nnect shows, ICT can *facilitate* such learning environments for ESD, but ICT should not be viewed as a learning environment for ESD in itself.

Transforming learning environments and learning tools

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In the course of the ENSI conference in March 2009,a variety of learning environments were, sometimes intentionally and sometimes unintentionally, created by the speakers. This provided the participants with 'food for debate' regarding the limitations, challenges and possible contributions of these learning environments to transformative learning.

Learning environments

During the conference social scientist's love for definitions and elaborated bullet point lists quickly became apparent. I must admit that I am not immune to their charm. We keep adding more and more words, trying to fit in each possible bend in the road, ending up with a concept the size and length of a superhighway. I fervently believe that we also have a responsibility to translate these findings into something useful and tangible for practitioners working in the field of ESD. This is by no means an easy task. Nonetheless, I would like to start with Manninen's assertion (2009) that there is a need for a concrete definition of learning environments in order to insure clarity and fruitful discussions. The concept of a learning environment has different meanings to different people (e.g. ICT designer, teacher and architect). It would benefit the many teachers faced with the task of creating 'learning environments' if a common language were available. One of the definitions Manninen provides originates in the Finnish National Core Curriculum for Basic Education (2004, p. 16) and reads: "The learning environment refers to the entirety of the learning related physical environment, psychological factors and social relationships. In this setting study and learning take place." This definition is broad and not very clear about the relationships between the elements. In my view a learning environment exists within the experience of an individual. Every participant and teacher will perceive a different learning environment because each has his or her personal frames of reference (Goffman, 1974). Although a teacher can greatly influence a learning environment, he or she can never create one. I myself prefer to define a learning environment in the context of education for sustainable development, in terms of the physical (or virtual) setting, in which a participant finds him- or herself trying to make sense out of things, working together with, and affected and supported by co-participants, influenced by,

and under the active guidance of a facilitator, guided by institutions (such as cultural routines), all in the pursuit of individual or group leaning goals, within an organized and co-designed learning process (Tauritz, 2007).

Transformative learning
The organized learning process, including the use of educational tools and didactical approaches taken, is an important part of the learning environment. Educators are faced with 'a candy store' filled with tools and approaches in all imaginable flavors. It became quite apparent during the conference how difficult it is for many of us, including scientists, teachers, policymakers and educational designers, to change the ways in which we teach and transfer information. We repeatedly suggest that there is a need for participation, learning by doing, collaborative learning processes, creativity, et cetera (Mayer and Tschapka, 2008). Yet during the conference, which can certainly be defined as a particular learning environment, the standard sort of one-sided dissemination of information which we fault for inhibiting so-called transformative learning processes, was frequently displayed. "Transformative learning involves experiencing a deep, structural shift in the basic premises of thought, feelings, and actions. It is a shift of consciousness that dramatically and irreversibly alters our way of being in the world (O'Sullivan, 2002)." Although O'Sullivan goes on to further elaborate his view, this seems to be the core of his concept.

ICT: learning environment or tool(s)?
One of the questions raised during the conference was whether or not ICT can be called a learning environment. Bearing the definition of a learning environment as a personal experience in mind, the answer is quite clearly: "No". It was concluded that ICT consists of a set of learning tools that can be employed to achieve certain learning outcomes, to engage learners and to spark curiosity and creativity.

Example of ICT use in ESD
During the conference, CO_2nnect, a school campaign investigating CO_2-emissions related to travel to and from school, was presented. It exemplifies the use of ICT in ESD potentially leading to transformative learning. Schools all over the world can sign up on the campaign website. Students make use of a digital platform containing tools for calculating and comparing CO_2-emissions between schools, both nationally and internationally, links to relevant web resources, photo galleries, and help sheets designed to assist teachers in evaluating and discussing results. Students can submit questions to a climate and transport expert and are encouraged to generate and share ideas on how to reduce CO_2-emissions and initiate a dialogue with the local community. The project gives children a voice and it offers

them the opportunity to connect with children in other regions and other countries. CO_2nnect is also an example of cross-curricular education connecting directly to the life world of children. The learning outcomes anticipated by the developers of this campaign include: a better understanding of climate and transport issues, enhanced participation, cooperation and communication skills and, certainly not least, motivation to take an active role in society. If these are realized, it can be said that transformative learning took place. The short term learning outcomes that are actually achieved by participating in CO_2nnect will be analyzed by a group of Malaysian researchers.

Digital platforms, such as the CO_2nnect website, provide information about their use by participating countries and schools, potentially steering scientists in the direction of interesting research topics. For example, examining the participants' list we see that more then 470 Romanian schools have signed up, whereas, only 3 Dutch schools have joined (on April 5th 2009). Many Northern European countries seem to be less involved in this project than would be expected on the basis of their high quality access to the Internet. What is happening here? Are these differences based on culture? Or perhaps a saturation of the field in which education for sustainable development takes place is the cause of these differences? Are there too many similar projects with digital platforms being developed? And if so, which are the most effective of these platforms? How can we assist teachers in finding suitable projects for their students amongst the many that are on offer?

Questions for future research
As a reporter, I was confronted with the challenge to 'listen in between the lines' of the participants' conversations and to search for possibilities for the enhancement of the practice and theoretical fundaments of ESD. Many interesting suggestions emerged during the conference. Some could immediately be put into practice. When we view the conference, for example, as a learning environment other participants can be seen as an important element in the experience. One participant noted that teachers, and especially young learners, are seldom seen at conferences, yet we sit there and talk about their learning and teaching processes as if we know what is relevant and attainable. Involving these groups in a more substantial manner, for example through specially designed workshops, could lead to a profound increase in the development and dissemination of knowledge directly applicable in practice. It is also interesting to consider more creative methods for the presentation of the results of the conference, as these could lead to more engaged participants and therefore better learning outcomes. A novel approach was taken at this conference whereby junior researchers played the role of reporters during the workshops and panel discussions. When I heard that a colleague was planning an alternative and imaginative way of presenting the results of her

workshop about drama and art, I at once started thinking what I could do with my group. In practice, however, time constraints made me fall back on a more conventional format. I challenge all of us to search for ways to practice what we preach.

Other questions which became manifest during the conference could steer scientists towards interesting research regarding learning tools such as ICT. An important question raised was: "What can ICT do for education for sustainable development, which cannot be done without ICT?" This question needs answering. Although there is a growing body of knowledge regarding the use of ICT in education, not so much is known about either short, or, even more importantly, long term learning outcomes. For example, how is empowerment affected by the use of ICT within the context of education for sustainable development? To what degree is transformative learning taking place? Researching long term effects is very challenging. Nonetheless, searching for methods to measure and understand the long term effects on behavior of particular learning environments, applied tools and other strategies is essential and deserves researcher's whole-hearted attention.

During the workshop about the use of ICT, one participant suggested that the website of the Co2nnect campaign should be designed differently. Currently the website is geared to the educational system, with children using the website at school. A next step might be to connect directly with these children outside of the school system. However, is this really desirable? How should issues such as indoctrination and the potential for creating guilt be addressed?
ICT offers the possibility for children to connect with children in other regions and even other countries. In practice, schools interact much less with other schools than they might. What is necessary to get schools to interact more with one another? One limiting factor might be that many teachers lack the skills and knowledge needed to work effectively with ICT. Students often know much more about the possibilities ICT offers than their teachers. In these situations teachers need to embrace new roles as facilitators, rather than 'ultimate' knowledge authorities. Another relevant factor could be variations in language skills. Children communicating with children in other countries often use English as their common language. This could create a significant barrier for younger learners who are not proficient in English. If such issues are playing a role, how can they be overcome?

As a group, it is our job to see that the knowledge about learning environments which we assemble as well as the learning tools we develop, both of which have the potential to greatly enhance transformative learning processes, become readily available to practitioners in the field.

Art and Drama as a learning environment for ESD

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Introduction
This chapter deals with the workshop in which the use of art and drama as a learning environment for ESD was explored. On the basis of some theoretical background and examples of the use of art in an ESD context the participants dealt with the following questions: What is the relevance of art and drama as a learning environment for ESD? What are opportunities and obstacles in the use of art and drama in learning processes?

We will first give some theoretical keystones for the use of art and drama in ESD; subsequently three different examples of the use of art will be presented; to end with an overview of the key conclusion of the participants.

The link between ESD and art
There are several reasons to integrate art in ESD related cases. First of all, looking at ESD from a 'complexity' point of view, the dialog between different disciplines -including arts- cannot be ignored. This dialogue promotes the exchange between different points of view and allows space for different ways of interpreting and expressing the world (Pujol & Bonil, 2008). We construct explanatory models in order to make sense of the world around us. Teaching and learning processes have the aim of changing these explanatory models in order to move them towards the disciplinary models. Teachers design inputs in order to stimulate the process of model change among pupils. When these inputs take into account the complexity of these phenomena, a sustainability perspective is promoted. This complexity perspective entails the incorporation of diverse inputs: questions, exchange of points of view, artistic incentives, etc. Painting, music, drama, dance, etc, can be useful to give a variety of inputs in order to help a rich exploration of a phenomenon and thus a change in the explanatory models towards perspectives closer to sustainability.

Furthermore, creativity helps to find new associations: it connects what before was or seemed unconnected (de Bono, 1970). Art activities have a tendency to reach the sensory, perceptual, emotional, cognitive, symbolic and creative levels of human beings, thereby offering a person new, often non-cognitive ways of interpreting experiences in the world (van Boeckel, unpublished work). Drama can serve as means to raise awareness, work with complex issues and reframe a perceived problem (Boal, 1992).

Considering these attributes of art-based activities, their use could be specifically valuable in the context of ESD. They could be a platform to explore new relations between humanity and environment. It also helps to imagine future scenarios which could give sense to present actions (Mayer, 2002).

Getting inspired

To clarify this line of reasoning, this section will present three examples in which art/ drama expressions were used in relation to ESD. These examples served as an input for the participants of the workshop to get an idea of how the artistic methods can be used and stimulate further exploration of the use of such methods as a learning environment for ESD.

Example 1: ESD Art Gallery – Exploring a topic by means of paintings

During the workshop the participants were invited to visit the ESD Art Gallery, in which paintings by Jackson Pollock (1912-1956) were shown (figure 1). Each of the participants was asked to select a painting that represented the meaning of ESD and explain why. The result was a list of characteristics of the paintings that corresponded to features of ESD.

Figure 1: Pictures by Jackson Pollock shown in the ESD Art Gallery

Some observations made by participants:

*"I've chosen this picture because there are lots of **connected lines** and colors. It's a bit chaotic. ESD is also like a network of different interlinked dimensions and sometimes you are lost in it...."*

*"In this picture I the two hands of a clock; I think the time is a very important component of ESD, because we are considering **next generations.**"*

*"This painting has lots of **colors overlapping** other colors. I think ESD is about connecting different **scales** and **levels** (e.g. local and global)"*

*"The whole idea of having different interpretations of painting resonates with ESD: you can always look the phenomena from different **perspectives**. ESD in that sense is divers."*

Example 2: Theatre of the Oppressed – Collectively gaining action-competence

This method, developed in Brazil by Augusto Boal to empower peasants, is used worldwide to address social adversities and give people that face a difficulty the competence to do something about the situation they are in.

In this workshop one of the many 'TO' exercises is tested with the participants. In this method the facilitator will ask a group of people to create an image (statue) of an external problem they face. Other people will analyze the image and describe what they see, and what they feel when witnessing the statue. Subsequently they imagine what they would like the statue to be if it were a 'perfect situation'. *What has to change?* They model the statue to their wishes and discuss what has to happen in order to move from the initial situation to the ideal. *How do these changes come about? And what can you do about it?*

Three elements of which this method consist are especially valuable in an ESD learning environment. First of all, an issue is **visualized.** Seeing something rather then only hearing about it has a greater impact on learners. They really feel connected with what is represented. Drama also allows you to work with people that are not used to learn or explore through reading and writing. Furthermore the image that you create is alive, it is tangible. Learners speak about something that is there, right in front of them, rather then 'somewhere out there'. This allows you to thoroughly **explore** an issue, which is the second element to be mentioned here. As you are creating images with people, the process is collaborative: it enables learners to explore all sides to an issue and it allows for many **perspectives and opinions.** As the represented situations are directly related to the learners, the latter will take ownership of the problem, the process and thus solutions.

Lastly, this drama method goes beyond talking about problems and imagining solutions; it also offers a space for learners to test solutions, thereby **practicing for reality.** This builds their self-confidence, by which they gain action-competence. Acting rather then talking furthermore

allows for very different solutions to emerge; by the different approach to an issue also different sets of options emerge.

Example 3: "Is water always in balance?" – Using bodily expression to explore the concept of sustainability
This activity is part of the didactic supply of the Escola del Consum de Catalunya[1].
 Is water always in balance? deals with the sustainable use and management of water. The concept of sustainable water consumption is illustrated through bodily expression: body balance is used as an analogy for sustainable development. The experimentation of different ways of balancing the body and the formulation of questions leads to the representation of sustainability as a dynamic balance between people and the environment.

Players 'purchase' water by chance (i.e. the amount of water the players consume, its origin and the form in which it is transported from source to consumer is determined by a dice); this allows students to enter into unpredictable situations. To resolve these cases with the concept of sustainable development they have to be inventive and creative. The activity ends by translating the extent (un)sustainability of their water purchases in bodily expression. Through the use of an adapted version of the known game Twister, students understand what it means to be in or out of balance and they invent different strategies for action.

Painting our conclusions
In the final part of the workshop, the participants were asked to describe opportunities and limitations of art for the use of ESD. They did so by means of concrete topics (e.g. climate change, natural resources, litter, etc) and different art forms (poetry, dance, drama, painting, etc).

Opportunities	Limitations
Art… • can be used as a metaphor (e.g. relating music to ecosystems) • helps to express your feelings (making a song or a poem) • helps to work with difficult topics • is a universal language; crossing borders of culture or differences in opinion/ religion • brings people together and binds groups • allows for different solutions to emerge: through creativity new pathways are opened • is relaxing, stimulates reflection or contemplation (e.g. putting classical music) • involves children • allows you to effectively put forward dilemma's and values (e.g. through poems) • makes you use your senses • is dynamic	• Often people are not used to creative processes and will back off when hearing what methods are used • Educators are faced with personal limitations in the extent to which they can actively use art. • Takes a lot of time… • Not everything can be solved or explained through art. It has to be combined with other methods.

Table 2: Opportunities and limitations of ESD

At the end of the workshop the participants created a painting as a representation of their conclusions.
The red color represents the **personal level:** both art and ESD are subjective and connected to emotions. These emotions are everywhere and at all times; the color therefore moves as a red sonic wave through the entire painting.
Art can contribute to ESD on a **methodological level:** it provides dynamics and vitality to our activities. This is represented by green, because it mirrors hope and it is drawn in the form of a machine that works to fulfill a concrete function.

1 Catalonia Consumption School from the Catalan Consumption Agency (Catalonia, Spain).

The yellow stand pretends to represent the **theoretical level:** a theoretical framework is needed to guarantee a quality way of doing ESD and art can help us to understand the main concepts or processes. This level goes across the painting in a zig-zag because it is all over the ESDing.

Blue stands for **communication.** It appears as a insecure stroke when we are worried about how to communicate all these conclusions to the people who did not **experience** the workshop and therefore might be unable to relate to the connection between ESD and art…

NOTA BENE

This workshop has been a collective experience, in which all the participants made a new picture to be exposed in the ESD Art Gallery. We are sure that this will not be the last and we hope that new representations of ESD will help us to find new ways to approach education and face the ever changing world. This workshop couldn't have been possible without the people who were brave enough to participate.

Acting and thinking through Art & Drama

A contribution by rapporteurs of workshop B: "Art and Drama as a Learning Environment for ESD"

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During the ENSI Conference, which took place on March 26th - 28th, I was asked to be the rapporteur of the workshop on "Art and Drama as a Learning Environment for ESD" with my colleague Marta. I accepted that task and thought we would have to take notes, from an external view point, about the emerging ideas and discussions of the participants. However when the workshop began I realised that we would have a better perspective on the 'process' if we had directly experienced the interactive activities proposed by Marta F., Marta G. and Natalia. As it was written in the program, workshop B was actually a highly interactive and engaging one.

Our view point on the experience …
Our contribution naturally constitutes just one of the possible view points and It is made of a variety of personal reflections emerged after our active participation. Such reflections, of course, are full of personal and professional experience and also the words we wrote down, should be differently understood by people from different backgrounds… What do you mean by *competence*? What is it *balance*? What does *creativity*, or *drama* mean? And so on…

Let's go to the workshop B… So we found ourselves creating a **bodily image** (statue) which described our professions in order to introduce each other, or a bodily image of different concepts related to sustainability or to Education for Sustainable Development (ESD), such as consumerism, power, complexity etc. Such bodily images allowed to bring forth personal ideas and to compare those with the ideas of others, by means of a non-conventional language which had facilitated the use of a more conventional verbal language. This tool was especially useful in such a context where people had to speak a foreign language and where sometimes, it requires an extra effort both to understand and to make oneself understandable.

We made statues, sounds, artistic images in a **cooperative way,** using our different **competencies** and interlinking the variety of our **view points** and experiences.

We were inspired by artistic and bodily images: in a broadened time we experienced actions by which we usually read the reality around us and that usually evolve in an unconscious continuum. In others words we had the opportunity of experiencing the fine line between **observation and interpretation** and how personal experience could affect our way of perceiving the world. The same picture or the same statue often suggested different interpretations, but always offered the opportunity of comparing and discussing the variety of ideas and emotions.

The workshop leader stimulated participants to bodily experience **balance and imbalance,** which are distinctive concepts of reasoning on the way of achieving a sustainable development. The relationship between Humanity and Nature consists of a complex and dynamic equilibrium. As non-sustainable actions should affect this dynamic equilibrium and so the system which we are part of tends to create a new end unexplored equilibrium. The peculiar feature of this activity consist of tackling this kind of reflection by mean of both a cognitive and a bodily dimension.

We would like to conclude by saying that all the activities proposed by the workshop leader, created a friendly atmosphere which facilitated the expression of different ideas and perspectives, feelings and emotions that usually do not emerge. This atmosphere also fostered people **creativity,** new ways of dialog, and the acknowledgment of our own body as a tool of expression.

We recognized as a critical aspect of the workshop, actually due to the **lack of time,** the absence of a wider, collective reflection on the process and an evaluation of the activities proposed in the light of the professional experience of the participants. In our opinion, it would have been useful to have time for reflecting on how these kind of applied innovations may positively affect or be integrated into one's own profession and also how they may be differently adopted by a variety of contexts which promote ESD: School, teachers training courses, national or international conferences, meeting addressed to citizens, etc.

We can consider the workshop as an initial step in which interesting and innovative tools were presented in an interactive way. It will be a personal task trying to professionally contextualize this experience.

Research gaps and opportunities

A reflection on the research dimension did not emerge explicitly during the workshop.

We think there is a sort of theoretical and experimental-based acknowledgement of the pedagogical relevance of Art and Drama in promoting teaching and learning processes. As reported by the UNESCO web-site the United Nations Decade of Education for Sustainable Development (DESD), spanning from 2005 to 2014, breaks down the traditional educational scheme and promotes, among a variety of desirable aims (an interdisciplinary and holistic learning rather than subject-based learning, a values-based learning, a critical thinking rather than memorizing, an involvement into a participatory decision-making, addressing local as well as global issues), also multi-method approaches which use word, art, drama, debate, experience, and different pedagogies which model the teaching and learning process.

There are also a lot of examples of science education research (this is our area of interest) focused on using innovative forms of pedagogy in order to deal with specific disciplinary or interdisciplinary topics or to promote a variety of competences, usually addressed to young students or trainee teachers. An example of course, is afforded by the research experience of the workshop leaders, members of different research groups (Calafell & Bonil, 2007; Bonil & Pujol, 2008). Just having one more example, the latest issue of School Science Review (a journal of science education) is titled Creativity in science and offers interesting articles. Nickerson (2009) for example speaks about science drama as a broad term linking science and drama and encompassing many types of activities. She gives a lot of example of different drama forms as physical drama, personification, scripted drama, role play, animation and film/video which used for tackling specific topics or ethical issues and also described two action research project looking in detail at how taking part in 'scienze drama' affected participants' knowledge and understanding of the science topics involved, as well as studying the conditions which best allow students' creativity to flourish.

It seems that we need a complex teaching and learning approach in order to enable future generations to tackle complex and controversial socio-environmental issues. It also seems that art and drama could widely enrich the way of teaching and learning.

But the main point is how to improve complex and multi-method approaches in everyday teaching and learning practices which occur in the schools of our different countries?

Our Research Group is conducting an ongoing **action-research** program on science education for sustainability, focusing on teachers' training over many years. The main objective

of the action research conducted by the research group consists of developing a **complex teaching/learning approach** which promotes a wide variety of competences, the integration of disciplinary knowledge, a dynamic idea of science and also a sense of inclusion into the socio-environmental systems, by means of interactive, interdisciplinary and reflective activities often based also on art and drama.

In the planning and implementation of educational activities, we gradually developed the approach of incorporating different elements and blending them in different ways, depending on participants' age, contexts and expectations. We usually propose "basket" of choices: the underlying idea is that each person with whom we establish a relationship has different attitudes, interests and also things that one might not appreciate. All these aspects need to be taken into account and respected. If our educational offering is rich and varied, then it is more likely that each person will find something motivating that can help him or her to grow and develop confidence in his or her own abilities. This "basket" is full of a variety of strategies: personal reflection, dialog and open exchanges with others to appreciate the variety of approaches and interpretations using as inputs vignettes (made by an artist colleague), videos, questions, etc; working in small groups to cooperate toward a shared aim; searching for links between disciplinary knowledge and everyday events in order to learn to contextualize scientific knowledge.

In particular, our group has devised and widely tested **role-plays** on controversial socio-environmental problems (Colucci-Gray et al., 2006; Colucci-Gray, 2009). These are complex activities, rich in opportunities with regard to knowledge and competences, as well as for the multiplicity of relational approaches that are offered. In addition, such simulations not only deal with complex and controversial socio-environmental problems and lead students to investigate implicit epistemic assumptions, but they also allow the tackling of the crucial aspect of conflict, proposing experiences of nonviolent transformation that are necessary in a framework of sustainability.

Using Quality Criteria as a Roadmap for ESD Schools

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Paul Vare
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The 'Quality Criteria for ESD schools' proposal was one of the main outputs of the ENSI-SEED research on school development and ESD presented in the Esbjerg Conference in 2005. After 4 years, and translation into 17 languages, what can we say its utility and interest for teachers and headmasters who want to engage on ESD? Is it possible to use the proposal as an 'organiser', a map of possible roads that could help schools to organise their own route to ESD? As we approach the mid-point of the Decade for ESD, do we have other criteria (or Areas of Criteria) to add to the proposal? How can we adapt this tool to different countries, and different stakeholder needs?

These issues will be debated during the plenary session between one of the authors of the booklet, Michela Mayer, and one invited discussant, Paul Vare an NGO representative who has been engaged in practical ESD projects in formal, informal and non-formal settings around the world.

Michela: While ESD is still an evolving concept, where different definitions and visions are possible, we have a compelling need to transform 'visions into actions'. In this situation of actions in uncertainty, what kind of orientations do schools and teachers need? Do they need clear indications or instruments for reflecting on their own practices in order to define by themselves what is the 'quality' of ESD they want to achieve?

Road maps could suggest the shortest way to reach an already identified location, just as satellite navigators do, but could there also be instruments we can use when we are not really sure of our destination; instruments that help us to explore and understand?
What kind of tools are the best to help schools – teachers, headmasters, students - to find their own route to ESD?

One of the last ENSI proposals to the ESD world has been a set of Quality criteria, and I ask you Paul to offer us a critical point of view on it, but before that, I want to clarify what do we mean by 'quality' in this proposal: quality cannot be reduced to standardised procedures but should take into account the 'educational values', the cultural characteristics of the local community, the emotions and perceptions, and not only 'facts'. This means that quality should deal not only with 'what we are able to do' following the already defined standards, but also with what 'we are attempting to do', thus meaning changes where no standards are fixed, and where we should create our own standards.

Educational processes are complex and dynamic in nature and we need a kind of evaluation that accepts this complexity, and that could be used as an instrument for change, focusing the attention not only on foreseen results but also on emerging, 'unexpected' outcomes.

As Aristotle said, quality and quantity are not contrasting terms, but this does not imply that 'quality can be reduced to numbers'. Robert Pirsig in his quest for quality (1974) makes a distinction between 'static quality', the one which pushes a system to achieve defined benchmarks and standards, and 'dynamic quality', the quality that a system needs when something new happens, when it is necessary to proceed in uncertainty where standards don't exist. Static and Dynamic Qualities are both relevant and necessary: *"without dynamic quality an organism cannot develop, without static quality it cannot last"*.

Paul: Given the complexity and uncertainty of our world and the ill-defined (if not unknowable) nature of 'sustainability', I'm not convinced that a map would be a particularly useful tool. We certainly need to navigate carefully through this terrain and I would suggest that frameworks are more helpful than maps. For me, the ENSI Quality Criteria provide a framework, one that is learner- (and *learning*-) centred.

As you have asked me to critique the ENSI criteria, I should mention that while I fully support the focus on learner participation, action competence and critical thinking, there is little in the criteria that links these skills or processes to sustainability per se. The case studies demonstrate how each criterion has been applied in the context of some sustainability-related content or curriculum area but the criteria themselves do not make the need for this link explicit. Such 'person building' could be equally effective in the training of corporate managers or rifle range attendants.

The ENSI criteria are redolent with an emancipatory view of education that I would support but without some reference to content can we really call this ESD? Isn't it just effective pedagogy?

In order to achieve a balance between the need for content that can be 'transmitted' and a constructivist view of knowledge that encourages us to think beyond what we are told, I would suggest using a two-part framework of ESD that is described elsewhere (Vare and Scott 2007). In short, this combines two visions of ESD which we have termed ESD 1 and ESD 2:

ESD 1 is characterised by the promotion of changes in what we do, often facilitating behaviours and ways of thinking where the need for this is clearly identified and agreed (e.g. conserving energy within the school).

This is learning for sustainable development.
Case Study 12 in the ENSI Quality Criteria handbook supplies an example of ESD 1 at work (where pupils transform the school grounds because they are encouraged/told to do so). Although the limited pedagogical value of this top-down approach is criticised and emphasis is placed on participation, the quality criterion still suggests that the school is audited "in the direction of sustainability" and that the school becomes "an example of careful management of resources." [NB This is the only criterion in the handbook that makes an explicit mention of sustainability.]

In contract to this emphasis on content and 'good' sustainable practice behaviour, **ESD 2** focuses on building capacity to think critically about [and beyond] what experts say and to test sustainable development ideas. This suggests that we explore the contradictions inherent in sustainable living.
This is learning as sustainable development. (Foster 2002)

Case Study 6 in the ENSI Quality Criteria handbook gives a good example of ESD 2 (although all of the criteria reflect ESD 2 in some way). I would highlight Case Study Example 6 because it looks at the role of values and encourages pupils to look at the interests that lie behind the statements and decisions that shape their world.
Rather than see ESD 1 and ESD 2 as competing opposites, they should be seen as mutually reinforcing, hence the Yin-Yang symbol supplies a useful heuristic for this relationship:

As our paper (Vare & Scott, 2007) states: "ESD 2 not only complements ESD 1, it makes it meaningful, because our long-term future will depend less on our compliance in being trained to do the 'right' thing now, and more on our capability to analyse, to question alternatives and negotiate our decisions. ESD 2 involves the development of learners' abilities to make sound choices in the face of the inherent complexity and uncertainty of the future." (Op. Cit., p.194) Balance with ESD 1 is important; if we only focus on ESD 2, we are not necessarily giving our pupils the opportunity to understand the widespread concerns vis-à-vis sustainability. For example, in his seminar at this workshop, Soren Brieting discusses the importance of 'ownership' as a key concept in education and building human capacity. Soren mentions that industrialists like teams of workers to feel they 'own' their machines because they look after them better. So we could, with such insight, develop a far more efficient workforce for any purpose, including the arms trade (not what most environmental educators had in mind).

Michela: Imagination is strongly culture based: in my imagination maps are not only accurate description of what you know (or what you think you know) but they are also an indication of what **is worth** knowing, and in some cases also of what you **don't know** for the moment.

Ptolomeus Map: a large part of the world was indicated as "terra incognita", unknown land.

In the Roman time, but also in medieval and renaissance time, many maps were only partially accurate: the description of what was already well known and identified could be compared with ESD1, while the unexplored part, the ESD2, was in general only sketched while a warning sentence advised: *hic sunt leones, here be lions.* The advice was as important as the detailed descriptions, telling the newcomers where their own exploration competencies need to be applied.

What the ENSI research group on Quality Criteria has tried to do in 2004-2005, within the European project SEED – School Development through Environmental Education - was to extract from a comparative research done on 28 'eco-schools' programmes in 13 countries (Mogensen & Mayer, 2005; www.ensi.org) not only the 'explicit' criteria guiding the programmes, but also the **'implicit'** criteria, and the different scenarios – the different visions of different futures – that characterised their proposal of school development.

The booklet on Quality Criteria for ESD-Schools (Breiting, Mayer, Mogensen, 2005; translated in 17 different languages), was a result of this research, and the leading idea was to offer a tool to *"encourage the integration of ESD in the normal life of school and consider engagement in ESD not as an extra burden for teachers and headmasters but as an opportunity for improving the existing teaching and learning and to provide innovation useful for the whole school".*

The booklet then tried to deal with both ESD1 and ESD2, but mainly to advise teachers and headmasters of the 'unknown land' they need to explore if they really want to go deeper into ESD2.

The explicit message was that sustainability in schools asks for a 'whole school approach', as suggested by the UN Decade documents. In the whole school approach vision, schools are invited to reflect on their own 'school image' and to become engaged in future, partially unknown, developments in the direction of a 'sustainable school'. The main idea is that school sustainability is not only related to the use of resources and to the respect of the environment, but also to changes in teaching and learning processes, into the school policy and organisation and in school's relations with local, national and international communities.

The criteria have then been defined in 15 areas, organised in 3 main groups:
1. Quality Criteria regarding the quality of teaching and learning processes
2. Quality Criteria regarding the school policy and organisation
3. Quality Criteria regarding the school's external relations.

Each of the 15 areas is introduced by an example of school practice - a short story inspired by the case studies collected - followed by a rationale, a synthetic presentation of the ideas behind it, and by a number of 'possible' quality criteria.

The criteria proposed are not 'exhaustive' and the schools are invited to discuss the proposal and to change and integrate the criteria. Areas and criteria are partially overlapping (when dealing with values we ask also for critical thinking, and future oriented actions cannot be planned without complex thinking…) but this was seen not as a limitation but as an element consistent with the complexity of the educational processes.

Paul: The whole school approach is also seen as the ultimate goal in England's *National Framework for Sustainable Schools;* however, this framework, in direct contrast to the ENSI Criteria, tends to focus on ESD 1. There are the three dimensions: Campus, Curriculum, Community, which map onto the three main groups of ENSI Criteria. So there is some overlap

between the English sustainable schools framework, albeit with an ESD 1 emphasis, and the ENSI framework with its complementary emphasis on ESD 2.

Teachers are invited to begin their ESD work via some existing initiatives in the school. The Framework therefore recommends approaching sustainability through one or more of eight 'doorways':

1. Food and drink
2. Energy and water
3. Travel and traffic
4. Purchasing and waste
5. Buildings and grounds
6. Inclusion and participation
7. Local well-being
8. Global dimension

From the ENSI perspective, item 6 on this list (Inclusion and participation) is of paramount importance and is clearly of a different order to the other themes or 'doorways'.

The doorways have been criticised because they have tended to be adopted by schools and training organisations as a kind of 'sustainability syllabus' which was never the intention. The term 'doorways' suggests that they are ways into sustainability issues; instead, they have become a somewhat atomised list of things to cover in order to help schools become more environmentally sustainable. The values that underpin sustainability are not made explicit except for a general reference to 'caring'. The doorway of 'inclusion and participation' at least hints at some educational values.

Michela: By contrast, the Quality Criteria may be viewed as an instrument which summarises and in some way specifies an educational philosophy for school development with respect to ESD: the criteria provides indications that help to turn values into educational actions, behaviours and choices. The criteria thus bring theory – utopia – closer to practice, and can be used as 'bridges' for moving from ideal values to the reality one wishes to change. In order to be a frame of reference and a binding element of a programme or a school, the quality criteria ask to be jointly constructed and accepted by all the participants.

Paul: Yes, participation is critical at all levels from the national framework, to institutions to learners. By asking participants for their own quality criteria we may gain insights into what they deem important – surely this is a more motivating starting point.Recently I was in northern Alaska where I was reminded of how local perceptions can be very different from

those of outsiders. Overhearing an Iñupiat Eskimo girl exclaim that she had seen, "the first tarmac of Spring," (because some of the ice had melted away from the road) struck me as an example of how external 'experts' can easily miss out on local perceptions and overlook novel criteria for measurement.

So the idea of joint construction is attractive because it offers authentic opportunities for participation and ownership, however, neither the ENSI framework nor the UK model has a clearly articulated vision of how a school might progress from an initial starting point to… … well, to what? The ENSI Criteria, for all their strengths as guidelines for good pedagogy, do not help a school to identify the answers to questions such as:

• Where are we going?
• How are we doing?
• How would we know?
• Do we need any standards?

Michela: The intention of the ENSI QC proposal was to offer an answer to the last 3 questions, leaving the first one open. The underlining idea is that 'sustainability' is still something that is very difficult to define in terms of clear medium or long-term outcomes. We have just long-terms aims (to have the mankind living in social and ecological equilibrium with a limited planet, where peace and ecological sustainability are part of the solution) and some compelling problems to solve in a short period (as energy waste, resources waste, productive soil and fresh water diminution, etc.…).We don't have yet a clear idea of the social, economical and technological changes that could be necessary for achieving our long terms aims: there are no clear maps or recipes.

In this situation, and educationally' speaking, contents seems not be a priority – all topics are involved in this quest for sustainability – and what we can offer as our contribution to this quest are mainly some principles of 'good education' allowing youngsters to participate in the quest. In the ENSI network we don't believe that clarification of values, critical thinking, taking care of the complexity, participation, action in the community, all ESD2, could be used in order to continue in the same 'unsustainable' development that the world is suffering at the moment. But we agree that it is important for teachers and headmasters to have clear examples of how to use these criteria in sustainability oriented actions. We should improve our booklet collecting more examples and information from ESD schools, remaining at the same time, open and flexible enough to be adapted to different cultural and educational situations. We have also to take care that in the last 4 years something has changed: the United Nations Decade for ESD has been launched but the 'whole institutional approach' still seems very

challenging in many countries, *"only 30% of Western European countries have developed this approach, and only 20% of the countries provide incentives to support it"* (UNECE Belgrade Conference, 2007). What we really need is a better diffusion of this whole school approach. Could a similar (improved) set of guidelines or Quality Criteria really become an 'organiser' for schools on their way to ESD? What suggestions come from the workshops in this Conference for further research in this field?

Paul: Two things would help here: (a) a clearer idea of progression, offering visions of the changes that may occur as schools become more ESD focused, and (b) more 'warts and all' examples that show the difficulties that were encountered and how they were overcome.

(a) Progression can be linear or cyclic. Webster (2004) suggests a four-part linear model from 'pre-awareness' to 'transformed' (although to date no schools appear to have achieved this higher state of being). I'm not recommending that we follow this but at least Webster has tried to articulate some form of progression. While we want to offer learners the opportunity to envision their own future and draft their own criteria, it may also be helpful to suggest some of the practical steps that others have taken along the way. This might sound more like a 'manual' than the ENSI Criteria would want to be – I too would reject the manual or checklist approach but there is space here for more examples of 'how it was done', e.g. telling us how a given school managed to achieve such a participatory teaching model in the face of deeply conservative forces such as the examination system or parental concern for 'standards'.

(b) The ENSI QC booklet tells us that:
"…in the real case studies you will also find obstacles and problems."
(ENSI, p.12)

It's a pity that we don't have a flavour of these obstacles in the book. Of course space is limited and tough editing decisions have to be made – but if I were a teacher in an English school, I'm sure I would gain important insights and even encouragement from understanding some of the battles that other teachers have overcome in order to achieve the examples provided in the book.

I too hope that the conference can suggest fruitful research avenues; adopting a 'whole school approach' and understanding what that entails for learners, parents, teachers and senior managers, is certainly an area that requires further understanding.
If I could remind ourselves of one important precept here (not that most of you need it!) it is to *start with where your audience is starting from;* it is their reality that counts.

Good practices in the use of Quality Criteria for ESD development

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Description of the Workshop
The workshop mixed presentations and discussion and proposed to discuss the use of Quality Criteria for ESD as a tool to reflect on aims and methods for ESD and learn from others experience with different target groups (teachers, headmasters, environmental associations, administrative organizations, quality school teams, etc.)

The following Questions has been proposed for discussion:
- What can the preliminary results from the survey of the use of QC for ESD in different countries tell us?
- How to use the QC ESD and similar tools in other networks and projects?
- Can we find a pattern in mechanisms that generate a feeling of ownership among participants to support engagement in the future of ESD innovations on a school?
- Self-evaluation: Is it a good challenge for progress?
- How to manage to learn in a democratic institution versus an authoritarian school structure by inviting pupils and teachers to participate?

As an introduction an activity was proposed to the participants:
- How to generate a feeling of ownership to innovations through participation – an activity and the link to the present ideas of using quality criteria for ESD development at school level. *See appendix at the end.*
- The question was: Can we find a pattern in mechanisms that generate a feeling of ownership among participants to support engagement in the future of innovations on a school?

Participants have been requested to fill in a one page 'graphic survey' about their experience in what factors generate a feeling of ownership to innovations. A simple eye-opener and activator of awareness of some of the basic mechanisms of quality participation.

Some outcomes of the workshop and reflections

The focus on what factors and mechanisms are important in the formation of a feeling of ownership to things, ideas, innovations, projects, achievements etc. are the following:

• To be involved in decision making from the very beginning of an intervention/innovation/a change/project/a teaching project (the earlier the more ownership).

• To have worked hard to achieve the change (even having overcomed obstacles)

• To feel comfortable with the whole thing by understanding some of the basic ideas, if they are not your own.

• To be taken serious throughout the period (being respected for points of view, being heard etc)

• To be able to find your 'fingerprints' in the final outcome (meaning seeing that you have been influential).

• To get some form of social recognition for your participation (not so much economic benefits).

• To realize the positive effect of your involvement for something to be better.

A feeling of ownership often called 'mental ownership' is understood from a psychological point of view in the way that the ideas/things/innovations you have got mental ownership to becomes a part of yourself (your extended self) and therefore they are important for you – you want to care for them and to make sure that they will still exist.
A high level of mental ownership by the involved 'local people' will be one of the most important mechanisms to make sure an innovation is sustainable. Likewise a high level of mental ownership generated among students to their school work and e.g. projects in ESD help them to develop ownership in the long run to the issues in the community they have investigated. To develop a high level of mental ownership to innovations as part of school development should be an obvious focus point.

Mental ownership can be seen as a 'measurement' of the outcome of level of quality participation – the higher level of mental ownership a kind of participation has generated the higher quality of the participation can we call it.

As described in the presentation of the preliminary results of the monitoring questionnaire related to the use of the quality criteria (QC) for SD school development the basic philosophy of the approach has been to inspire to as much participation as possible and as high a level of quality of this participation as possible. Without a high level of mental ownership among teachers and other staff at a school new innovations will not work well and easily become a burden or vanish away when the focus isn't that much any longer on the development.
During the workshop it was highlighted that some kind of input and support is often needed for a school to develop further. Some kind of guidelines and inspiration is often needed and best wish human support, in the form of an advisor or other resource person that can show an interest in the issue and support the school and help to overcome obstacles.
The support of the school can take a number of ways. From the experience from Barcelona it was clear that inputs and self-evaluation could be a very helpful tool.

The ENSI QC for ESD booklet has a lot of potential but at least some teachers find it too much to jump into if they get the understanding that everything has to be achieved at once. This misunderstanding should be avoided through a more clear indication of the many small steps to take in a wanted direction as the best approach, opening for grounding the changes in the daily life of the school and giving more time for relevant reflections and correction.

To sum up what could be useful for the future use of the QC ESD booklet:

• The basic emphasis on high quality participation for school development through a focus on ESD seems to be justified.

• The booklet has proven useful for planners and educators with more overall obligations and interest in the development of ESD.

• The inclusion in the QC ESD booklet of indications of good teaching practice etc. might in some cases blur the vision of ESD but on the other hand support the idea that a focus on ESD for a school can be used for more general school development and modernization of the teaching practice.

• The booklet has proven useful for teachers and headmasters that are already active in the concrete field of ESD but may be without realizing it.

• To introduce its use for headmasters in a region in a short seminar style (half a day might be enough) seems to be a good idea.

- An introductory folder with a focus on ESD development at the school level should be developed with motivation at the end of making use of the QC tool for further work.
- A publication with more in-depth descriptions of ESD projects at school level should be produced and disseminated as a follow-up to the ESD booklet.

ENSI Conference Leuven 26-28 March 2009:
Workshop A-2: Good practice in the use of Quality Criteria for ESD development.

Soren Breiting

Which situation creates mostly a feeling of ownership (highest level of mental ownership) ?

Ex. When starting a new thing on the school. – Compare the pairs!

Being the idea maker of a new thing	Being told from a colleague about a new idea you have to be involved in
Low level of ownership ___ High level of ownership ___	Low level of ownership ___ High level of ownership ___
Getting a new thing through easily	**Having to work hard to finally come through with a new thing**
Low level of ownership ___ High level of ownership ___	Low level of ownership ___ High level of ownership ___
Being told that because this or that of your implemented idea something is now functioning much better	**Understanding that nobody regard your new innovation as really useful after its implementation**
Low level of ownership ___ High level of ownership ___	Low level of ownership ___ High level of ownership ___

Getting more insight into some social mechanisms because you see the effect of your new idea	Not learning anything new through the implementation of your new idea
Low level of ownership ___ High level of ownership ___	Low level of ownership ___ High level of ownership ___

Being told to take part in some innovation you really cannot see the meaning of Low level of ownership __ High level of ownership __	**Getting full insight in a new thing before you participate in its implementation** Low level of ownership __ High level of ownership __
Everybody forget that you were the one who were proposing the idea for the innovation Low level of ownership __ High level of ownership __	**Being mentioned as the one who came up with the new idea after its implementation** Low level of ownership __ High level of ownership __
Being asked to present the innovation to others after its implementation Low level of ownership __ High level of ownership __	**Nobody is asking for any information about the outcome of your new idea** Low level of ownership __ High level of ownership __
It is impossible for you to see traces of your ideas in the final implementation Low level of ownership __ High level of ownership __	**You can clearly identify your 'fingerprints' on the final implementation of the innovation** Low level of ownership __ High level of ownership __
You experience some benefits from the implementation of your new idea Low level of ownership __ High level of ownership __	**You only get troubles from the implementation of your new idea** Low level of ownership __ High level of ownership __

Preliminary descriptive analysis of the QC survey – a working paper

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Introduction and background

The quality criteria research took point of departure in a collection of national reports from 13 OECD countries on implicit and explicit criteria guiding Eco-schools' development processes in whole school plans. More specific, 28 'programmes' or proposals for 'eco-schools' which involved over 3500 schools in the years 2003-2004 were collected and analysed. From these documents a comparative research study was conducted aiming at analysing trends and divergences in the Eco-schools' programmes and conceptualisations of learning-teaching processes.

This comparative study was the outcome of the first and second stage of the research originally launched by the COMENIUS III European network programme: 'School Development through Environmental Education' (SEED). Inspired by this analysis the third stage of the research resulted in the publication "Quality Criteria for ESD-Schools" (Breiting, Mayer & Mogensen, 2005), which proposes a non-exhaustive list of 'quality criteria' for schools that wish to work on developing Education for Sustainable Development. This publication, which is the main contribution of the research, has been disseminated and translated into17 languages
During 2008 an Internet based survey on the Quality Criteria publication (QC booklet) was prepared and distributed into 12 different countries / languages. The purpose of the survey, that includes qualitative as well as quantitative items, was to explore the potentials and the constraints that relevant stakeholders in the countries may have experienced in working with the QC booklet. Thus the respondents was asked, among others, to give their opinion on the relevance of the booklet and the ideas presented in it, the possible use they have made of it and suggestions for improvements.

The survey was originally formulated in English but by help of the national ENSI coordinators or ENSI friend this English version was translated into the respective national languages (English, Norwegian, French, Slovenian, Belgian, Portuguese, Catalan, Italian, Danish, German, Swiss, Hungarian, Netherlands, Finnish, and Austrian). The respondents for the survey were

teachers, headmasters, teacher trainers, researchers, NGO's, EE (or ESD) Centers and educational officials in the community, region or government.

In total, 674 respondents have opened the Internet site with the questionnaire. However, only 276 have responded to the first item and a varied, yet descending number of respondents, have answered the remaining items (approx. 130 respondents in general).

Results with some comments

The **1st item** focused on what kind of institution, the respondents represents. The table below shows that the majority of the respondents represents primary, primary and lower secondary and secondary teachers (73 %). However, this result is not very valid; as it turns out that many respondents unfortunately leave the questionnaire at this very early stage.

What kind of institution do you represent?

	Count	%
primary school	78	28.3%
primory and lower secondary school	46	16.7%
secondary school	77	27.9%
teacher training institution	14	5.1%
university (not teacher training)	5	1.8%
national educational authority	4	1.4%
local educational authorit	6	2.2%
EE (or ESD) Centre	11	4.0%
other (please specify)	35	12.7%
Total	276	100.0%

In the **following and 2nd item,** the respondents are asked to mention their role at the institution that they represent. Following the distribution above, most of them are teachers and headmasters but also curriculum developers, senior researchers, advisers, coordinators of EE programs, teacher trainers are among the respondents. The 'gallery' of respondents thus reflects a great variety of persons within the educational system in a broad sense.

The next and 3rd item asks the respondents to reflect on to what extent they think the booklet represents ideas and perspectives that can contribute to develop ESD. The table below shows that more than 3 out of 4 of them (76.6 %) consider the booklet to be valuable in this sense to a great or a considerable extent - while only a little minority (3.6 %) considers that the booklet does not represent valuable ideas and perspectives within this field.

The booklet represents ideas and perspectives that can contribute to develop ESD

	Count	%
a great extent	38	27.7%
considerable extent	67	48.9%
moderate extent	27	19.7%
slight extent,	5	3.6%
no extent	0	0.0%
Total	137	100.0%

In general, a promising and great result that can be exemplified by a quotation of one of the respondents:

"The ideas are helpful for developing and carrying out projects. For me personally they were important cornerstones for school development".

While this result above reveals, that the respondents in their opinion to a high extent find that the booklet is valuable in a theoretical sense, the next item concerns to what extent they in practice have made use of the booklet in their personal work with ESD.

Extent of use of the booklet in personal work with ESD

	Count	%
a great extent	15	11.2%
considerable extent	49	36.6%
moderate extent	48	35.8%
slight extent,	19	14.2%
no extent	3	2.2%
Total	134	100.0%

The table shows, that a bit less than every other (47.8 %) state that they have made use of it in their personal work to a considerable or even great extent; while a bit more than every third (35.8 %) mentions that they have done this to a moderate extent. Approx. every sixth respondent has not used the booklet.

We have not directly data or evidence that can explain what reasons that could clarify or deepen this result. However, one explanation could be a simple one: that the respondents have not taught ESD or EE since reading the booklet (see table p. 5). Another reason could be that

the respondents are unsure of what the formulation 'made use of the booklet in personal work' actually means (see later). A third reason could be that they find the general idea behind the booklet highly relevant (and thus is more positive regarding the previous item), but that they also find it difficult to use it in practice for different reasons.

Some qualitative data can exemplify this:

"The publication with its criteria is an expensive list of different quality criteria and examples for implementation. However, they lack concrete and practical examples, how the criteria can really be made part of teaching, leadership and other activities in schools. Some local practical examples could be added into the national versions of the publication. They could specify how the criteria could be utilized in teaching and developing the actions in schools".

"The publication as a whole is valuable and distinguished. However, in my opinion the use of it suffers from the unstructureness of the whole/entity (too many things constantly overlapping) and complicated language/vocabulary".

In the first quote, the respondent finds that the example for each area is not well enough elaborated, while the other points to the structure and/or the language.

Given the fact that the population for the survey comprises respondents both within the school level (teachers, headmasters, etc.) and respondents beyond or outside the school level (local or national educational authorities, teacher trainers, coordinators, etc.) it could be reasonable to make a cross analysis that examines whether these two groups of respondents have the same or different opinions regarding the above mentioned issues.

The booklets contribution to develop ESD versus profession

| | *school level* | | *not school level* | |
| | In general, to what extent do you think the booklet represents ideas and perspectives that can contribute to develop ESD | | In general, to what extent do you think the booklet represents ideas and perspectives that can contribute to develop ESD | |
	Count	%	Count	%
a great extent	23	23	15	38
considerable extent	48	49	19	49
moderate extent	23	23	4	10
slight extent,	4	4	1	3
no extent	0	0	0	0
Total	98	100	39	100

p < 0.18

The table above shows (however insignificant) that the respondents working outside the school level appear in this survey to judge the booklet a bit more positive compared to the respondents who have their daily work within the school level (teachers, headmasters). Thus 87 % of the first group state that the booklet represents ideas and perspectives that can contribute to develop ESD to a considerable or great extent – while this is 'only' the case for 72 % of the second group.

Making the same type cross analysis on the issue of making use of the booklet in their personal work, the following results appear:

Personal use of the booklet versus profession

	school level		*not school level*	
	More specifically, to what extent have you made use of the booklet in your personal work with ESD		More specifically, to what extent have you made use of the booklet in your personal work with ESD	
	Count	%	Count	%
a great extent	8	8	7	19
considerable extent	34	35	15	41
moderate extent	38	39	10	27
slight extent,	14	14	5	14
no extent	3	3	0	0
Total	97	100	37	100

$p<0.26$

Again, an insignificant difference appears when the two groups are compared – however not so dominant. 60 % of the respondents from the 'outside group' state in this survey that they have made use of the booklet in their personal work with ESD to a considerable or great extent – while 43 % of the 'inside group' presents this statement.

Thus in general, there seems to be a tendency that the QC booklet is valued a bit more positive with the group of respondents who have a profession outside the school level. This is a challenge for further research and / or reflection to investigate the reasons behind this finding!!!

When it comes to an analysis of how the respondents have made use of the booklet, the following table – **derived from the 4th item** - can shed some light on this issue.

Kind of use of the booklet

	Count	%
I have worked with the idea presented in the booklet with my students	50	38.2%
I have presented and/or discussed the booklet with my colleagues at the institution where I work	78	59.5%
I have presented and/or discussed the booklet with colleagues other than the one where I work	36	27.5%
I have used the booklet as inspiration for curriculum development at national or regional policy level	34	26.0%
I have used the booklet as a source for theorising on ESD	56	42.7%
I have not yet used the booklet but I think I will make use of it in the next 6 months (please specify)	14	10.7%
Others (please specify)	11	8.4%
Total	131	100.0%

The table is elaborated from an item that allows the respondents to tick more than one of the options. It shows that the option most often chosen by the respondents (6 out of 10) is related to presenting and/or discussing the booklet with their colleagues at the institution where they work. This response could explain the result presented previous, i.e. that respondents at the school level state a lower level of use compared to respondents outside the school level. The result could thus be related to the understanding of formulation 'made use of the booklet'. Assume a teacher discusses the booklet with a colleague, they probably do not consider this as 'a real use'. For them real use would entail that they actually work with the idea presented in the booklet with their students. However, discussing the booklet with others is also a fruitful use of the booklet because in this way it gives rise to evaluating and reflecting on their own teaching.

As the next often chosen option by the respondents is using the booklet as inspiration for curriculum development at national or regional policy level (more than 4 out of 10) while a bit smaller number of respondents have chosen the option that they have worked with the ideas presented in it with their students.

The following and 5th item was formulated as an open question, allowing respondents to elaborate more in detail their opinion on what ways they think the booklet reflects ideas / perspectives on ESD that are close to or not so close to common practice in their country. Most

of the respondents refer to the areas, mentioned in the publication. The booklet thus distinguishes between 15 different areas within which it proposes a number of quality criteria; which in turn are presented in 3 broader groupings (quality of teaching and learning processes, school policy and organisation, and schools' external relations).

Regarding ideas and perspectives **close to** common national practice, 47 respondents wrote their opinion. 7 of the respondents were of the opinion, that all the areas mentioned in the booklet were close to common practice in their country while most of them (25 respondents) state different areas as familiar to their practice – however with an emphasis on quality criteria connected to teaching and learning processes, for instance:

"I think the publication is in line with the common procedures in my country. I got acquainted with it in the SEED-Comenius seminars"
"The criteria aims at a change in the values and attitudes of the students (pupils). The development of pupils' own thinking is important. Teaching and learning should rise discussions and reflections among the pupils which should lead into experiential actions".
"Area of action-based perspective Area of participation Area of school climate Area of learning results but less in the area of school relations with the community".

One of the most central ideas in the booklet is that quality criteria are not seen as fixed in stone, not even complete as a list and not solely imposed by outsiders. Instead the philosophy within the booklet is that quality criteria are co-specified with stakeholders in an ongoing process. Seen in this perspective quality criteria should be considered as a starting point for reflections and aims at facilitating discussions within the school and with all stakeholders to clarify the main aims and eventually changes in order to develop the school's own list of quality criteria, adapted to the school's own situation and plans for change. Understanding this epistemological argument around teachers and other stakeholders use and work with quality criteria is thus a fundamental aspect – see the box at the end of this paper for an example.
This way of working with quality criteria is indicated in some of the qualitative responses, which means that this idea has been accepted by these respondents, for instance:

".......I think that it could be good that more teachers were effectively working in ESD in their school participate in the elaboration of criteria (I don't know if they have already participated...)"
"The "Example"and the "Rationale" serve as a basis for ideas about school development, and during arguments among teacher staff they encourage the use the modern teaching and learning opportunities and support continuous development. They show how is it

possible to deal with the basic themes in the local community simply, easy to understand, and make them natural in the practice".

"The experiences and the presented results coming from different areas give a reinforcement for schools and other educational institutes or groups committed to sustainability. The set of quality criteria helps the formulation of own values and to apply value expression and acceptation in everyday practice of schools".

"Fundamental provider of impulses with in-service training character. It was naturally not easy to realise with children with severe, multiple".

Regarding ideas and perspectives not so close to common national practice, 33 respondents stated their opinion. Following the result above most respondents (21) state that quality criteria in the group 'school policy and organisation' and 'schools' external relations' are more or less absent in their country. Especially many respondents have written text that can be identified to belong to the categories: 'Area of school policy and planning',' area of school management', and 'area of Community Corporation', - for instance:

"Area of a culture of complexity. Area of school policy and planning. Area of community cooperation (all these needs more effort and openness of all, school and community people too) Area of networking and partnerships (existing but are at the begining and are concentrating at punctual actions and less at long lasting activities bringing authentical changes)"

"collaboration with the community."
"Culture of complexity and perspectives for the future; school policy and planning, school management; reflection and evaluation on ESD in the school".

The 6th item is focusing on the 15 different areas of quality criteria. Related hereto the respondents are asked to state which of them they think are of special interest as regards further development of ESD in their country.

Areas of quality criteria of special interest as regards further development of ESD

	Count	%
Area of teaching-learning approach	62	60.2%
Area of visible outcomes at school and in local community	38	36.9%
Area of perspectives for the future	55	53.4%
Area of a 'culture of complexity'	31	30.1%
Area of critical thinking and the language of possibility	51	49.5%
Area of value clarification and development	46	44.7%
Area of action-based perspective	30	29.1%
Area of participation	55	53.4%
Area of subject matter	32	31.1%
Area of school policy and planning	29	28.2%
Area of school climate	48	46.6%
Area of school management	40	38.8%
Area of reflection and evaluation of ESD initiatives at school level	36	35.0%
Area of community cooperation	39	37.9%
Area of networking and partnerships	44	42.7%
Total	103	100.0%

Again, the item was structured as a multiple response question in which the respondents could tick as many of the options as they wished. The table shows that the most frequent response was quality criteria in the area of teaching-learning approach – 6 out of 10 respondents did that. But also the areas of perspectives for the future and participation were often chosen (more than 5 out of 10).

Interesting and challenging is that relatively few respondents (3 out of 10) stated, that the 'area of action-based perspective', 'area of 'culture of complexity' and 'school policy and planning' were of special interest as regards further development of ESD – the latter not least because of the responses to the former item.

The respondents were asked to indicate their reason for this or these areas of quality criteria. 53 did that. To illustrate both the variety and the thoughtful reasons made by the respondents, some of them can be shown here:

"From the point of view of our common future these areas are equally important. We feel at the moment these ones important to emphashied for the local communities and users

of the schools, but maybe other areas will be important and should be emphasized as the time goes. The flexible and dynamic action and thinking is important".

"From my point of view each of them are very important, and during a complex development none of them could miss, or if any of them is missing the idea and goal of education for sustainable development could be easily hurt. In many schools one or other element functions well, but the areas of the booklet are part of a chain, one comes after, from and for the other".

"We should educate the pupils to be a creative, active, critical thinker adult who apply the theoretical knowledge in practice and could identify and solve problems and conflicts. For this we need methodological renewal. To know each other's (pupils, teachers, parents, other partners) work. Encourage the others to appreciate and support others' work. The pupils should see the consequences of decisions, which affect the future, and for this they need complex knowledge and knowledge transfer (subjects). The active participation in learning "actions" introduce them into the decision-making processes. In order to realize all of these a supportive school management and ethos is needed. For achieving the goals partners are indispensable. Are we going in right direction? For this we need continuous measurements, consequences and developments which come from them. What the country needs in this process we could probably identify with a survey, but the most important is to know what the individual schools needs, how they can find what they need"

"I have chosen all of them because all of them seem important to me in developing an ESD focused school".

"Because I really think that, more than simply learning contents, ESD focus on developing a critical thinking, on cooperative working and on the need of commit oneself in building a better world. And also, in the management field, as far as an adoption of sustainable criteria in the school policy and organization is concerned"

"School management must bear from a consensus between students and teachers, a fact linked with participation. Such a management must be coherent with city council sustainability criteria. Furthermore, there is a need for communication about the results, in order to motivate students and also to link the school with their community. Students must understand that environmental problems are complex, with a lot of uncontrollable factors, and the only way to face it is through both critical thinking a language of possibility. Schools must network and work cooperatively to jointly progress and interchange

experience. Finally (I can't mention everything!), I think we must be critical in the whole process and evaluate it, in order to improve it next year. Often, programs that foster introduction ESD in schools (Ag 21 & EEVV) make the evaluation of the schools, but not themselves as a program".

"Education for the good, the beauty and truth. Understanding of school as interrelated system which develops permanently; support for students and teachers in their maturation and training process".

"I think it is more effective working top-down, that is to say, introducing compulsory contents in the school programs. All the teachers must work on the field of ESD, in the same way that mathematics is obligatory, and nobody discusses if it is interesting or not".

A cross analysis that distributes the responses according to the two groups – respondents within the school level (teachers, headmasters, etc.) and respondents beyond or outside the school level (local or national educational authorities, teacher trainers, coordinators, etc.) produces the following results:

Areas of quality criteria of special interest versus profession

	school level		not school level	
	Count	%	Count	%
Area of teaching-learning approach	45	64%	17	52%
Area of visible outcomes at school and in local community	28	40%	10	30%
Area of perspectives for the future'	38	54%	17	52%
Area of a 'culture of complexity'**	18	26%	13	39%
Area of critical thinking and the language of possibility	33	47%	18	55%
Area of value clarification and development*	29	41%	17	52%
Area of action-based perspective*	18	26%	12	36%
Area of participation**	34	49%	21	64%
Area of subject matter	22	31%	10	30%
Area of school policy and planning	20	29%	9	27%
Area of school climate	35	50%	13	39%
Area of school management	28	40%	12	36%
Area of reflection and evaluation of ESD initiatives at school level**	20	29%	16	49%
Area of community cooperation*	24	34%	15	46%
Area of networking and partnerships	29	41%	15	46%
Total	70	100%	33	100%

* *significant at the 0.05 level, * significant at the 0.1 level

The analysis of the data shows that the respondents not belonging to the school level have another opinion on what areas of quality criteria that are of special interest as regards further development compared to the respondents who work at the school level. The responses to three of the areas are significant different at the 0.05 level: 'Area of a 'culture of complexity', the 'area of participation', and 'area of reflection and evaluation of ESD initiatives at school level' – while 'area of value clarification and development' and 'area of community cooperation' are significantly different at the 0.1 level, when the two groups are compared.

This difference is exemplified in a qualitative response written by a respondent who, by profession, is not belonging to the school level:

"The management/leadership of schools towards an ESD-school requires systematic actions. The school has to make a plan for sustainability. By carrying out and evaluating that plan the working conditions of the school can be improved. The nationally created criteria for sustainability in learning organizations give outlines for the plans made in schools. Because of the principles of curricula and common discussions in the society participation of the students/pupils has been given an important role At the moment the schools are searching for varying ways to implement the participation".

In the **last and 7th item** the respondents were asked to give comments/ suggestions that could be useful for improving the publication and its use within their national educational system -and 41 respondents did that. By using the qualitative analysis method of post categorisation it has been possible to extract the most common ideas that the respondents gave to this item.

Thus, it is possible to identify the following categories that provide suggestions for improving the booklet (where responses not really considered to dealing with suggestions for improvement are excluded):

• Focus on an epistemological perspective by organizing learning processes around the booklet – for instance, pre-service and in-service teacher training

- Strengthening the dissemination of the booklet
- More concrete examples and advice as how to implement the booklet and its ideas into the school
- Improve the translation
- The booklet is OK – no suggestions for improvement

Examples of responses to these categories are – where some, of course, are overlapping:

The epistemo-logical perspective

"Much more "common/ joint space" should be provided: Distributing the brochure alone does not guarantee that the ideas are spreading! I am sure that many of the brochures are not read. Therefore: this subject matter needs to be integrated in teacher preservice and in-service training, not only for colleagues interested in biology".

"Ability tests for beginning teacher students as they are planned already; in-service training for teachers"

"The brochure is in touch with reality and much of it can be used in classroom teaching and in projects. It is not easy to manage which colleague will make use of the brochure. I envisage accompanying measures – e.g. that a representative of ENSI visits the school and talks to (our GP) teachers. We are rather a vanguard school in the matter of environment".

"Development of exemplary courses for teacher training along the (oriented on the) brochure"

"I propose also to present and work these materials with teachers in way to inspire these educators to develop and adapt these ideas into a educative system of the different countries. I suggest also to create one tool to collect the experiences into schools with the quality criteria in the ESD framework; It's not a tool evaluate"

"Don't stay only with the booklet. It's necessary a yearly reflection about the efficacy of the booklet in a way it come a dynamic tool. For to develop a longtime work in this area, this booklet is a good systematization and its useful to promote ESD".

"I like that book. Maybe it would be useful to give examples on how start/motivate processes of reflection in teachers groups in which dominate those without scarce involvement in ESD neither EE. One more suggestion is to add some web addresses that publish experiences and processes really carried out by schools".

Dissemination

"Values and action guides formulated in the booklet should be disseminated through every possible channel. Media could play a crucial role in this".

"It will be great if this booklet arrive to the different institutions of education in different countries".

"The booklet must to be disseminate by every schools and in on moment after it was important to organize a meeting with coordinators, experts, teachers and institutions already evolved in ESD projects and networks, and others school elements into the way to inform and train all the school in ESD".

"To disseminate the booklet near all the school staff; To ask the Ministry of Education his agreement with the booklet and ask him to publish and distribute it; Promote the booklet near the local government".

"Much more involvement of the governmental Education Department"

"Stronger advertising! Only a small part of intersted persons has the criteria at hand. There is a lack of persons who distribute and apply".

More examples and advice

"The publication with its criteria is an expensive list of different quality criteria and examples for implementation. However, they lack concrete and practical examples, how the criteria can really be made part of teaching, leadership and other activities in schools. Some local practical examples could be added into the national versions of the publication. They could specify how the criteria could be utilized in teaching and developing the actions in schools".

"I think it would be useful to contain examples regarding the national curriculum, examples of good practices from Romania. It would be easier to make the transfer from the information of the booklet to the practice".

"I like the idea of exemplifying criteria with a short story, but it could be interesting to add more examples, and less idealized, in order to see a larger range of possibilities for applying the criteria".

"Tto cite concrete examples including the organisational measures"

"Seek for examples out of the economic, the social and cultural area (in the moment there is a predominance of examples from ecological area)"

Better translation

"The publication as a whole is valuable and distinguished. However, in my opinion the use of it suffers from the unstructuredness of the whole/entity. (too many things constantly overlapping) and complicated language/vocablulary. The problems in the vocabularly/ language play a big role especially in the Finnish version, where the demanding concepts have been translated directly, without being opened in the 'Finnish thinking"'

"Seek for examples out of the economic, the social and cultural area (in the moment there is a predominance of examples from ecological area); better translation. Development of exemplary courses for teacher training along the (oriented on the) brochure; develop a short version for persons from education policy and education administration"

The booklet is OK – no suggestions

"I am very content with the existing brochure".

"The brochure is ok"

"For me personally the publication is clear and well structured – I have no suggestion for improvement"

An example on the use of the booklet from Hungary

The Hungarian EE expert used the leaflet as a part of a general in-service training about competence development. The 28 participants had chosen to analyze two examples after reading the whole booklet. One of them was the example presented under 7th area of action-based perspective. They agree that the example could easily be adapted to the Hungarian school life, and it is very useful because could give a framework of long term work. The participants mentioned that most Hungarian teachers prefer short term campaign like activities in spite they know that those are not very effective. Also to realize observation and studies outside the walls of school is very rare but it also known as a very attractive way of the pedagogical work.

The other example chosen to analyze was: 3. Quality criteria in the area of perspectives for the future. The participant agreed that this example is very creative for presenting the necessity of long-term fore sighting thinking. They seemed this example easy to realize and very motivating. The overall comment was that the combination of examples and rationale is a very effective way of publication because the rationale could be used for paperwork (applications, pedagogical plans and so on) and the examples give a lot of idea for the practical pedagogical work.

The trainer overall comments was that the publication helped her lot to demonstrate how the theory could be realized in the practice.

And she plans to use the booklet also in pre-service training in the future.

ESD Experiences of Schools in Korea in a Vision of Quality Criteria

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Since UN Decade of Education for Sustainable Development (DESD) launched in 2005, it was necessary to start new ESD (education for sustainable development) activities or to integrate it into the existing educational practices in schools or in other sectors of the society. However, there are difficulties in implementing ESD because its concept is ambiguous and abstract. Moreover, it is complex and has argumentative features. In many cases, people don't know how to begin with ESD because there's a gap between rhetoric and reality.

In this case, exploring excellent ESD cases can provide the chance to understand and learn ESD itself. Also, the standards or criteria of ESD that contribute as guidelines enable to start new initiatives or to reorient existing educational practices towards ESD. ENSI (Environment and School Initiatives) developed 'Quality Criteria for ESD schools (QC)' based on the case studies of 13 countries on Eco Schools in 2005 (Breiting et al., 2005). This QC can be a reference for developing ESD programs or activities that can be carried out in schools or other educational settings. Also, it can be served as the criteria that can be used to check how ESD can be connected to various existing educational practices that are being implemented. This presentation aims to introduce ESD cases in schools of Korea and to explore the relationship with QC to interpret these cases in a vision of QC.

Cases of ESD in Korean schools includes two cases within the curriculum, one in conjunction with curriculum and community, one from extracurricular activity and the other from ESD model school based on whole-school approach. The first ESD case can be found within one subject 'Environment' in Jincheon middle school, which involved students in issue investigation in local community (Lee, 2008)[1]. Through this course, students had the time to mind-write thoughts about the local market, the golf course, the green-school, plastic bags and fast-slow food etc. within the Jincheon and Chungbuk area. They then had the opportunity to actually head out to the community and explore the area. Through this project, students were given a

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1. The status of ESD in Korea and its several cases were introduced in details by the same author (Lee, 2008). This presentation briefly introduces those cases and tries to reinterpret them in a vision of Quality Criteria.

chance to re-think about the local market from a social, environmental and economical perspective and then gave several suggestions such as re-organizing the parking lot in order to vitalize the traditional market; new tourism strategies; utilizing a wrestling hall as a study area as part of green-schooling; and strategies to reduce flyers. The idea to reduce flyers was posted on the district office homepage, receiving much attention from the residence and also feedback from the relative local government officer. From these cases, we can learn how ESD can be combined easily without changing the existing curriculum greatly and connecting the issues and themes with the community or promoting social, environmental and economic sustainability. The second case implemented within 'Ecology and Environment' in Sungshin high school curriculum had students experience the economic and social aspects related to ecological issues.

The third case is a multidisciplinary approach where various courses and the community come together. The science teacher at Sungseo Middleschool suggests that several subjects come together for a course related to Eco-village (Lee, 2008). As a result, an integrated education was carried out on the environment and the community through Science, Social-studies, Ethics, Korean and Art courses, etc. Investigating and researching the environment of an area was done in Science; exploring possibilities of ecological community through understanding and distributing the regionally issued currency was done in Social Studies; and a presentation on eco-community and the environment was performed in the Ethics class. The Korean class was composed of reading writings on ecological environment, composing poems and reading it to the classmates; and Art class was composed of taking photos of a series of related activities. These activities can be seen as a multidisciplinary approach where several subjects came together under a theme 'Creating a Vision on Eco-Village' with relation to a sustainable future. This activity which grew to become a community festival bears greater significance with the fact that it not only lead to the participation of students and the faculty and but also created partnership between parents, Hansalim, NGOs such as the Korean Ecoclub, the media, and community organizations such as the district office. The fourth case is from extracurricular activity conducting energy audit in high school.

A more active move on Regional Center for Expertise on ESD (RCE), which requires a more innovative and general endeavor, can be seen in the case of Tongyeong (Lee, 2008). Inpyeong Elementary School has played a leading role regarding ESD in Tongyeong. It had applied to be designated as the model-school for ESD, and continued its efforts to integrate ESD into various aspects such as in the curriculum, school activities, study projects etc. We shall draw attention to the learning process of the teachers as well as the diverse attempts and active participation of the members of the school. The teachers of this school, in the beginning, were ignorant of

how to apply ESD, how it is connected and integrated into the regular courses and at other schools. However, they gradually transform into a 'learning community' that studied and brought changes to the school, by listening to lectures, participating in workshops, applying them to actual classes and discussing with fellow teachers.(Lee, 2008).

As for the criteria of ESD, Tilbury(1995) specified characteristics of environmental education (EE) for sustainability, which included relevance, holism, values, issue-based learning, environmental action, critical education, three-fold approaches, future dimensions, etc. These criteria can be a bit enumerative, but it's meaningful because they dealt with criteria that can be easily found in many ESD-related documents comprehensively. Based on this, Tilbury & Wortman (2004) suggested imagining a better future, critical thinking and reflection, participation in decision making, partnerships, and systematic thinking as important aspects and criteria for ESD in the book "Engaging People in Sustainability' published just before the beginning of DESD. Meanwhile, Mayer (2004) emphasized the importance of local, situational knowledge, dynamic qualities, complexity, and action research in EE for sustainable future and highlighted the role of ENSI to realize it. In addition, the International Implementation Scheme developed by UNESCO (2004) to help countries or actors to initiate ESD after the declaration of UN DESD and designation of UNESCO as a leading organization describes the characteristics of ESD as interdisciplinary, holistic, values-driven, critical thinking and problem solving, diverse learning approach, participatory decision making, locally relevant, etc. The other important development of ESD criteria was developed by ENSI based on case studies on eco-schools in 13 countries including Austria, Australia, Greece, Italy, Norway and Korea (Breiting et al., 2005). QC is classified into three major groups including Quality criteria regarding the quality of teaching and learning processes, Quality criteria regarding the school policy and organization, Quality criteria regarding the school's external relations. Each group of criteria is divided in smaller areas. For each of these you will find a short description of the area (a rationale) and a presentation of a number of criteria. Quality Criteria regarding the quality of teaching & learning consists of Teaching-learning approach, Visible outcomes, Perspectives for the future, 'culture of complexity', Critical thinking & language of possibility, Value clarification and development, Action-based perspective, Participation, and Subject matter. Quality Criteria regarding school policy and organization includes School policy and planning, School climate, School management, and Reflection/evaluation of ESD initiatives. Quality Criteria regarding the school's external relations deals with Community cooperation, Networking and partnerships. Based on these, the next criteria can be extracted for reference, e.g. participation, learner-centered decision making, locally relevant (community cooperation), learning values, critical thinking & problem solving, diverse learning approach, understanding complexity, action based, inter-disciplinery, trans-disciplinery, holistic, consideration on future, partnerships, etc.

As you can see, many schools in Korea have implemented various educational attempts that are related to ESD. These ESD activities can be tried within the current educational course without many difficulties. Three categories that are classified in QC – the course study process, school management, the relation between school and outside, etc.- and the sub-criteria can contribute greatly to evaluating how these activities reflect the features of ESD.

Based on this extracted criteria, we can see that the ESD cases of Korea emphasize learner-oriented activities, relation to the region, value study, understanding complexity, various access points to learning, etc. The other criteria such as 'the aspect of implementation base', 'consideration for future', 'partnerships', etc. are found just in some cases. The emphasis on these aspects is needed.

In conclusion, various criteria that are included in QC can not only be used as an important standard in planning and implementing ESD activities, but also used in evaluating various related activities that are being carried out. However, there can be several issues when we consider or discuss ESD with the vision of QC. Do we have to integrate ESD in terms of content or focus on nurturing the capacity through the approach method? Or do we have to take both ways? How much is possible in terms of the integrated access for ESD in a sectionalized school based on subjects? Also, how much participation should we pursue?

More basic questions can be asked. If each element of QC is achieved reductively, can we say it's ESD? Or should there be a more integrated reality for ESD? In addition, how can we make a proper QC for each situation? How can we make ESD go mainstream within the school system? The answers to these issues and questions might be gained in the process of implementing and evaluating many ESD cases.

The Barcelona Schools Agenda 21 evaluate the progress of their own program

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The Barcelona's School Agenda 21 Program offers to schools an instrument containing a host of **assessment criteria** and a qualitative scale of achievement indicators to help them to determine what stage of development they are and, accordingly, the direction in which they want to and are ready to progress. We present that tool and some conclusions after three years of implementation.

School Agenda 21 stems from a political resolve to broaden the notion of sustainability and best sustainable practices in Barcelona city by encouraging educational centres to become actively involved.

The programme relies on education as one of the keys to establishing a culture of sustainability since it is dependent on the ability to bring about positive changes to people's attitudes in terms of thought, feelings and action, and to the way institutions operate.

On the context of the Barcelona Agenda 21, the School Agenda 21 promotes innovative education along the lines of education for sustainability, fostering a major review of educational practices and approaches that would give rise to actual changes in centres and their settings. This is not a momentary proposal for action; rather, it is a call for all parties involved (pupils, teaching staff, families and other members of the school community) to embark on a project in the medium- and long-term.

The Schools Agenda 21 is based on the will to build a more sustainable school and society and involves educating people to give them the ability and to make them feel able to transform their reality. In order to achieve this, the programme works on the gradual understanding and adoption of sustainability criteria, encourages all parties involved in schools to take part, especially pupils, organises participatory learning that encourages critical thinking, the adoption of a number of perspectives, deliberation and negotiation, and which also encourages

people to make decisions individually and collectively; and carefully addresses the educational context and is aware of messages in the hidden syllabus.

Environmental education for sustainability is conceived as being a process aimed at raising awareness about and encouraging interest in socio-environmental issues and the global problems they pose, and also at strengthening people's ability to work individually and jointly on solving current problems and preventing potential problems that may arise in the future. The aim is not to use education for understanding and acceptance, but rather for understanding and action.

With the support of this programme, schools can look into conflicts occurring within their milieu, consider alternative perspectives, contribute to solving the problems identified and transform this process for analysis and action into an educational resource. Indeed, the course to sustainability entails a long learning process that unfolds both in and out of the school. School Agenda 21 provides schools with a proposal for a simple, flexible work scheme. Its aim is to allow schools to organise their own course of action and to progress in their own manner and at their own pace. There is no single standard to follow. Each school and educational community should set its own goals and challenges according to its possibilities, and the will and ability to bring about change.

When a school has planned and implemented five annual projects, we invite them to go on to a new form of participation whereby they prepare a five-year report and subsequently present a tri-annual project.

Self-assessing the process and the results achieved is a commitment taken on by schools regardless of the specific goals and actions they have carried out. Assessment becomes a powerful tool in order to bring about change and provide feedback for the programme in all respects, and also expresses the desire to continue to develop and broaden the improvement process.

In order to make the evaluation, we offer schools an instrument containing a host of assessment criteria and a qualitative, descriptive scale of achievement indicators so all schools can see their results reflected, they can determine what stage of development they are at and the direction in which they want to and are ready to progress.

Due to the complexity and diversity of strategies for unfolding the SA21, the most significant criteria have been chosen in accordance with the philosophy of the programme and they have been organised into five main sections:

1. Criteria linked to the educational project and development of the school centre
The objective is to determine the existence of a consensuated set of ideas in relation to sustainability, its presence in the educational project and practices, and the degree of coherence between what is pursued and what is done.

2. Criteria linked to the curricular project and development of the centre
The objective is to identify the degree of curricular integration of the contents linked to the principles of sustainability and the degree of coherence between what is sought to be taught and what is effectively taught and learnt.

3. Criteria linked to resource management and to the improvement of the physical environment
The objective is to determine which improvements have been introduced into the school centre in relation to the management of energetic resources and water, the consumption of materials, responsible purchasing, waste treatment, mobility, the improvement of biodiversity, acoustic comfort and, in general, with respect to the quality of the spaces of the centre and in its surroundings.

4. Criteria linked to the social climate and to the internal functioning of the school centre
The objective is to detect the quality of the innovations which are manifested in the social environment and in the internal functioning of the school linked to the principles of sustainability: participation, communication, attitudes with respect to changes...

5. Criteria linked to relations of the school centre with the exterior
The objective is to detect the diverse types of exchanges which the school centre establishes with the exterior, as well as their purpose and contents, the actors who intervene in them, the origin, extension and intensity of such initiatives, etc.

For each assessment criterion there is a progressive sequence of indicators, from less to more. Each school should decide the level on which they consider their school stands.

At the end of each school year we assess many aspects including the extent to which the programme's support services have been accepted and used and to the quality of the programmes. When analysing the attitudes respect self-evaluation, we find:

Type A schools: **evaluation** is considered as an important way to learn and to progress

Type B schools: this tends to be the largest group with more heterogeneous behaviour. One change we particularly value is moving from what is essentially a descriptive report on to one that constitutes a genuine self-assessment.

Type C schools: Some of those schools feel that evaluation is a waste of time.

If we gather some distance and reflect on schools' achievements and performance, we are aware that most of them are not exclusively linked to our programme; rather, they relate to common aspects in any innovative programme that seeks to re-conceive of and transform schools. However, we can identify certain aspects that pertain to the SA21, areas in which we wish to strive for the positive side, despite certain areas of performance that show the opposite trend. These are as follows:

- The conviction that education fostering genuine independence and participation is one of the keys to training critical citizens who are committed to reality.
- An aptitude (or difficulty) for delegating a fraction of authority.
- Any change is experienced as a challenge that creates expectations (or generates apprehension and reinforces control mechanisms).
- The aim is to achieve coherence between discourse and practice (otherwise, heterogeneous and conflicting organisational models and educational strategies are indiscriminately accepted).
- A school is shaped which teaches the importance of raising questions (rather than providing elaborate answers) and strategies are fostered which help in the quest for creative answers (rather than promoting changes in determined behaviour).
- The conviction that solutions to socio-environmental conflicts must be collective efforts and initiatives (rather than individual ones) and schools must encourage a social culture founded on cooperation and communication.

This is what we are heading for, slowly but surely.

Quality criteria for school's development work

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ENSI school's principles EE and ESD have been playing an important role in our school's development work. We have used different Eco schools definitions and lists of quality criteria for guiding our school's daily work. For high quality ESD work Hönttämäki School has got the Eco school Green Flag award and Finnish environment certificate for schools.

The Quality Criteria of ESD Booklet in my Finnish School

Hönttämäki School is situated in Oulu in the northern part of Finland. There are about 200 pupils and 13 teachers in our school. The Sustainable Development work of Hönttämäki School began because of the enhanced general importance given to the environmental education in the beginning of the 90's. In our environmental teaching we started to focus on versatile nature education. Quite soon we made our first environmental program, which represents school's daily life as a possible learning environment. Now we are developing our school to become a better ESD school.

Our curriculum is the bases of the teacher's work at school. Furthermore, when aiming for the quality of ESD, we have made an annual sustainable development program of action for our school. With the curriculum and sustainable development action plan we have systematically developed our school's quality of teaching and school's culture.

The ENSI quality criteria (Breiting, Mayer, Morgensen, 2005) have not truly lead our school's ESD work, but when preparing for this workshop presentation I used them as a checklist. I searched examples of how the ENSI criteria had come true in our school. It was quite difficult to specify how the criteria inside the booklet "Quality Criteria for ESD-Schools" can be realized in a Finnish school. I noticed how the national curriculum and school's culture can influence the way of implementation. My opinion is that ENSI's quality criteria for ESD work are good guidelines for any good teaching and learning. That is why I recommend to develop these criteria more concrete to make them easier to use for teachers. Maybe some kind of self evaluation list could be useful for schools to steer their ESD work. Our school has applied for a Comenius partnership "Quality now and tomorrow" together with schools from Greece,

Slovakia, Spain, Czech and the United Kingdom. Our plan is to make a DVD on how ENSI's quality criteria for ESD are realized in different schools. It can be useful to notice how these criteria are suitable in different school curricula and school cultures.

In Finland we have used ENSI's quality criteria when we have developed our national environmental certification system to "Sustainability Criteria for Educational Establishments". When you write national criteria for good ESD work it can be more detailed, because of the curriculum, national guidelines and strategies.
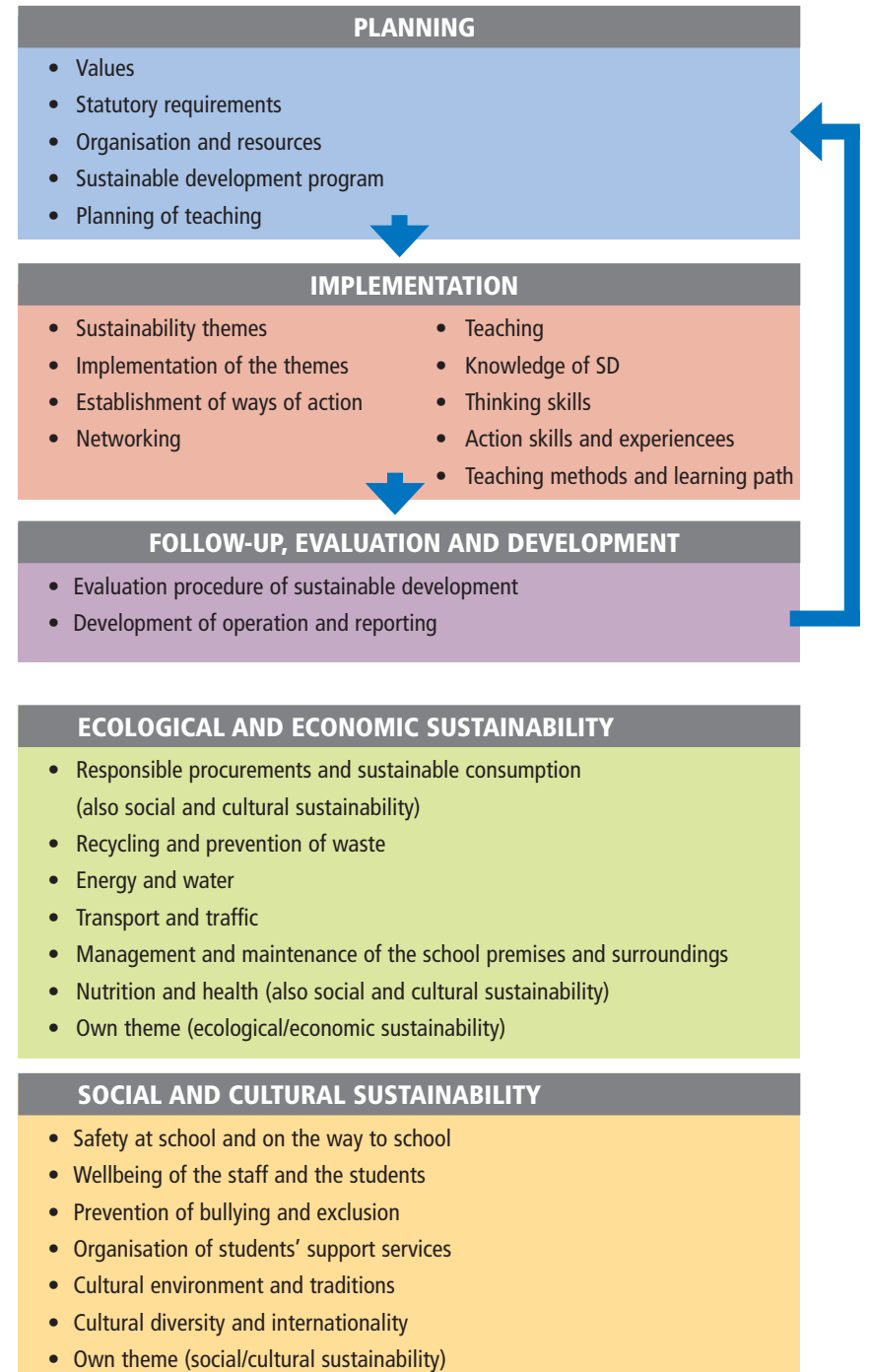
The Sustainable Development certification system for schools and educational establishments in Finland

The Finnish national commission of Sustainable Development established a sub-committee for education to make a national "Strategy for Education and Training for Sustainable Development and implementation plan 2006-2014". The result is a joint plan for various participants to strengthen the important role of Education for Sustainable Development. It contains for increasing cooperation and promoting networking on a local, regional, national and international level. The strategy contains fourteen proposals for action. One of them is that there should be a Sustainable Development programme of action in every educational organisation by 2010. This programme consists of management, teaching and daily practices. Education for Sustainable Development in educational establishments comes true in teaching and in school's general culture (Finnish National Comission on Sustainable Development, Sub-comitee for Education, 2006).

The goal is that 15% of day-care centres, schools and educational institutions should have received the eco School award (in Finland it is called Green Flag) or an external certificate for their Sustainable Development activity by 2014.

In Finland we have had an environmental certification system for educational establishments since 2004. This certification system includes background and self-evaluation material for schools and an external auditors network. The criteria for environmental certification have now been updated to sustainability criteria in February 2009. (http://www.koulujaymparisto.fi/index-en.htm)

The structure of the criteria is based on the continuous improvement model known from quality thinking: plan, do, evaluate and develop. There are 24 criteria framing the school's ESD work. The school can choose five themes from theme boxes and work one by one with them during the years. Working in this ESD frame with these criteria, schools can work step by step towards the level of certification. (http://www.koulujaymparisto.fi/keke_kriteerit.htm)

PLANNING
- Values
- Statutory requirements
- Organisation and resources
- Sustainable development program
- Planning of teaching

IMPLEMENTATION
- Sustainability themes
- Implementation of the themes
- Establishment of ways of action
- Networking
- Teaching
- Knowledge of SD
- Thinking skills
- Action skills and experiencees
- Teaching methods and learning path

FOLLOW-UP, EVALUATION AND DEVELOPMENT
- Evaluation procedure of sustainable development
- Development of operation and reporting

ECOLOGICAL AND ECONOMIC SUSTAINABILITY
- Responsible procurements and sustainable consumption (also social and cultural sustainability)
- Recycling and prevention of waste
- Energy and water
- Transport and traffic
- Management and maintenance of the school premises and surroundings
- Nutrition and health (also social and cultural sustainability)
- Own theme (ecological/economic sustainability)

SOCIAL AND CULTURAL SUSTAINABILITY
- Safety at school and on the way to school
- Wellbeing of the staff and the students
- Prevention of bullying and exclusion
- Organisation of students' support services
- Cultural environment and traditions
- Cultural diversity and internationality
- Own theme (social/cultural sustainability)

Input for the ENSI workshop report on "Good practices in the use of quality criteria

Wim Lambrechts

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1) Which applied innovation did emerge in the workshop and should be culturally compared?

- The use of the ESD Quality Criteria booklet in different schools in Europe can be compared, in order to detect barriers, driving forces, success factors, problems with practical implementation etc. *(presentation of Seppo Saloranta)*
- Make a comparison between different approaches in ESD: what role does the government play, what are the schools doing, where do they cooperate with other stakeholders (e.g. NGO's, enterprises, etc.). *(presentation of Hilda Weissmann, presentation of Soren Breiting))*
- Cooperation with the community (possibilities and difficulties). *(presentation of Sun-Kyung Lee)*

2) Which innovative ideas occurred and require more theoretical fundaments and empirical research?

- More research is needed on the cooperation with the community, what are the good practices, what are the possibilities and difficulties? *(presentation of Sun-Kyung Lee)*
- More research is needed on action based quality criteria *(in general)*
- More research is needed on participation and learner-centered decision making *(in general)*

3) Which research results have been reported and offer fields for innovation in practice?

- Whole school approach with community involvement. *(in general)*
- Differences between top-down approach (e.g. make it compulsory) versus bottom-up approach, with the alternative of a "third way": offering top-down frameworks for bottom-up participation, in order to enhance the influence and ownership of ESD (thus mainstreaming it). This "third way" may be called the "inspirational way". *(in general)*
- The booklet of Quality criteria is a very good starting point, but teachers need more practical examples, more shared experiences, etc. *(in general)*

Critical Perspectives on promoting Quality Criteria for ESD: Engaging schools into reflection on the quality of ESD

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European ESD schools have right now accumulated a broad experience on developing towards sustainability. Many countries and regions have settled programs as resources for local schools in Europe to develop education for sustainability with the commitment of local and regional administrations as well as universities and NGO. This wide experience provides a solid background for the ESD international community to engage into reflection on the quality of what has been done to the present. This reflection could include not only what ESD quality dimensions and criteria are important but also the meaning of ESD quality itself. ESD quality constitutes a vision of the school that is valued by the community. However, building such a vision is certainly a difficult task that needs to be undertaken jointly with all the actors involved in school ESD. The language and culture of quality has mainly come from politicians and administrators and today it represents a tool for strong educational control. It is then important to rethink the concept and build a new meaning so that it can be useful for all members of the school community: teachers, parents, students, researchers and politicians.

ENSI, as an international association, constitutes a community where such type of reflections can be done jointly with all different stakeholders from different international contexts. In fact, among other ENSI publications, the study coordinated by Mogensen & Mayer (2005) has strongly contributed to the field of ESD research and practice by undertaking a cross case analysis of ESD school programmes from a wide range of international contexts. This work was used as a background for the development of an ESD quality criteria scheme (Breiting, Mayer & Mogensen 2006). The value of this work is obvious since it represents an important attempt to build a solid picture of the quality of ESD in schools. The 2009 ENSI conference provides a context where to rethink the concept of ESD quality within two strands: ESD quality criteria as useful representational products and also ESD quality development as the processes that facilitate the establishment of a quality culture in ESD schools.

The workshop F aimed at creating a space for enhancing participants' reflection on the concept and processes of ESD quality development through active participation in building the group ESD quality criteria scheme and also through the exchange of opinions and views when reacting to case study presentations. The workshop methodology included an activity for building a common vision on quality criteria based on participants' inputs as an example of inductive process for ESD quality development. In addition several case studies based on research and practices were presented focusing on different aspects of ESD quality development. One case presented by Prof. Rosa Diketmüller dealt with gender and diversity issues in learning environments. Another case presented by Dr. Mervi Aineslahti introduced the teacher-researcher view point reporting on a 7 year action research study on sustainable school development. Finally Dr. Merce Junyent exchanged the results of a collaborative study on developing ESD quality curriculum within green school networks. The results of the workshop's discussion will be organized around the following two issues: (a) introducing new dimensions of ESD quality into schools: Challenging ESD quality dimensions and (b) facilitating ESD quality reflection in schools: Tensions in quality development in schools.

a) Introducing new dimensions of ESD quality into schools: Challenging ESD quality dimensions

The questions that the workshop addressed in relation to the dimensions of ESD quality were: What other areas of ESD quality in schools would be important to include? What are the most addressed ESD quality areas in schools? What do these absences and emphasis indicate on ESD quality in schools?

There are many ESD quality criteria schemes circulating within the ESD literature on policy, research and practice. ENSI proposal is one among others that has been developed trough a research work on cross case analysis. In any case all ESD quality criteria are symbolic representation of those valued aspects in ESD. Since ESD visions are cultural and contextual we would not be able to accept a homogeneous representation of a quality ESD. Any representation will then be tight to a place, time, community and beliefs systems. ESD quality criteria could be then associated to a specific product representation. Here, the metaphor of a road map is a powerful one that illuminates the type of representation ESD quality criteria could be. This map metaphor includes all the possibilities on ESD school quality that could be valued, issues to think about, examples to instantiate principles etc..

There are several ESD quality areas that need more reflection given the globalization process of today's world. One is "networking and communication" for ESD in schools. Although it has been included in all ESD quality criteria schemes much needs to be done to make it a better tool for teachers, students and families. Developing ESD networking and communication in schools involves several challenges: (a) keeping communication going, (b) establishing real partnership, (c) developing a sense of community, (d) developing a culture of complexity, (e) enhancing political influence, and (g) need of extra funding. Another important ESD quality area that need more work is "developing a culture of complexity". Although this area is felt as being really important, little resources are available for schools to develop it. The challenges for the development of a culture of complexity in schools are twofold: (a) the construction of the meaning of complexity (historical sources and diversity), and (b) the didactical transposition of complexity in the curriculum. Finally, a third ESD quality area that can be stressed is "dealing with diversity". The diversity of school community is really high in european schools and it represents a source of opportunities for developing ESD. The work of Dieketmuller presented by the author and discussed in the workshop is a good example on how gender issues are relevant when developing ESD programs around the school yard.

b) Facilitating ESD quality reflection in schools: Tensions in quality development in schools

The questions that the workshop addressed in relation to ESD quality reflection in schools were: What processes or activities best promote ESD quality reflection in schools? How can we promote a school change that is valuable for ESD? What tensions undermine ESD quality development in schools?

ESD quality is also a process in the sense that it should include the actions of building the ESD visions in schools and the changes to reach them. Staying within the map metaphor, ESD quality would also include making decision as for the way to reach some ESD valued aspects even if they are never reached. ESD quality would then imply a way to travel within the valued ESD vision through reflection. ENSI has enforced for many years a vision of ESD school change as action research. The results of this approach to ESD school and teacher education change have successfully collected within several ENSI publications (Kyburz-Graber, Hart, Posch & Robottom 2006; Espinet, Mayer, Rauch & Tchapka 2005). Promoting ESD quality reflection in schools is then a central part of ESD quality development.

ESD quality development in schools is a process dense in tensions. The first of these tensions deals with the "sustainability of quality development". As it was clearly illustrated within the case of Aineslahti school teachers might experience change addiction by being constantly confronted with change proposals serving the purpose of improving the quality of education. Finding the right equilibrium is today a challenge for good ESD school teachers. Another important tension emerges from the dual nature of "school teacher empowerment".

ESD quality development promotes empowered teachers who can act autonomously making their own decisions, and who can act professionally keeping a balance between autonomy and dependency from external resources. A third important tension is the "community based ESD quality development". Little can be advanced if ESD quality development is only concerned with teachers excluding students, parents, and the wide educational community. Reflecting on ESD quality must find more inclusive strategies so that a common culture can be built in each particular context. The case presented by Junyent is a good example on how action research can be a strategy promoting ESD quality development which includes educational administrators, teachers, teacher educators and students. These actors are usually involved in many ESD school programmes and sometimes hold different and also divergent quality criteria schemes which need to be applied to schools. Creating educational communities which reflect on ESD quality development becomes a crucial activity to alleviate part of the tension. All these previously mentioned tensions point at the need to engage into a culture change in relation to ESD quality development. It appears important that ESD school communities engage into a change (another!) from the culture of technical evaluation to the culture of acknowledgment which is at the roots of any ESD quality development in schools.

Journey in the Landscape of Sustainable School Development: experiences based on a 7-year action research study (2001-2008) in Sorrila School, Finland

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The theoretical bases of this doctoral dissertation are systems approach, sociocultural learning theories, transformative learning, pedagogy of connection and niche-construction and sustainable professional and school development.

- Systems approach: Interconnectedness of the parts of the system (Bunge 1983; Senge 1990).
- Transformative learning: It is a change process, transformative learning in the framework of sociocultural learning theories/cultural historical activity theory/CHAT). The learning changes both the learner and the environment. Learning is meaningful, it matters, you put yourself in it. It is connected to your real life, emotions and social interaction.
- Lifelong learning: "Schools should become 'communities of practice', where the predominant practice is 'learning', and where concomitantly, the 'elders' of the community are themselves exemplary learners, and skilled coaches of the arts and crafts of learning" (Claxton 2002).
- Pedagogy of connection: "….rejecting the dualities that separate nature from culture, and environment from individual (and thus, by extension, body from mind). ..The rejection of these dualities is fundamental for approaching sustainability in what may be termed 'a holistic' way, of recognising that everything is connected and that it is unhelpful to think of people as somehow separate from the systems and mechanisms that regulate the environment, and that the mind is something that transcends it all. When applied to education, the rejection of these dualities leads to a need for a greater connection between disciplines". (Dillon, P. 2006, 263)
- Niche – as a cultural pattern: a functional 'place' for learning: "The concept of niche provides another route to this complex set of relations. Niches define the position or roles of individuals within given situations. They are manifestations of competition between beliefs, ideas and forms of behaviour, and arenas in which transactions take

place between the people who hold or practice them."(Dillon 2006, 270).

- Sustainable professional development: "Good change processes that foster sustained professional development over one's career and lead to student benefits may be one of the few sources of revitalization and satisfaction left for teachers"…"If teaching becomes neither terribly interesting nor exciting to many teachers, can one expect then make learning interesting to students?" (Fullan 2001).

- Sustainable school development: "Sustainable educational leadership and improvement preserves and develops deep learning for all that spreads and lasts, in ways that do no harm to and indeed create positive benefit for others around us, now and in the future…. Sustainable leadership honours and learns from the best of the past to create an even better future" (Hargreaves 2007) vs. " respect ,value and preserve the achievements of the past" (Unesco\UNESCO Education - Objectives and strategies.htm)

The following research questions were especially relevant concerning learning and how research and practice can support each other:

- 1. Which were the learning experiences of the pupils during the development period?
- 2. How did the coordinating teacher develop personally?
- 3. How were the targets of ENSI- and other projects closely linked to it accomplished?

The learning experiences of the pupils, the teacher researcher and the school as a whole were shared. They could not be separated from each other. Learning took part in cooperation and collaboration. It was a common goal. It was also noticed that not only the school community, but also a wider local community was part of the learning. And finally the wide 'ENSI-family', national and international, became part of the learning community. Learning took part in the conferences, meetings, training courses and Comenius- and other shared projects.

Action research results:

1. Be a role model for the behaviour you want to enhance. Aunt Green was a positive and emotional change agent.
2. Problems can lead into improvements when they are handled in a positive way.
3. Developing takes time. The results are not seen instantly.
4. Sharing responsibilities is important.
5. Teacher training connected to developing projects is effective.
6. Parents are an important source.
7. A wide developing project gives room to a wide range or staff abilities. It is part of ' staff diversity' and sustainable school improvement.
8. Networking benefits the whole school community

9. Developing projects make the international contacts and networking a natural part of the school work.
10. Resources brought by the projects help in developing school and learning environments.
11. Positive experiences increase the commitment.
12. Sustainable leadership makes the developing possible.
13. Integration into former experiences is part of sustainable developing.
14. A developing project makes school improvement more structured.
15. A developing project is a good way to improve the school curriculum.
16. Developing project increases the feeling of community and school satisfaction.
17. Developing project gives a natural way to implement the integrative themes of the curriculum into daily learning experiences.

ENSI targets and how they were accomplished:
- Leading guidelines –not a strict Quality Criteria
- Own solutions- developing from own needs
- All ENSI targets were accomplished by the developing project (Comenius/SEED):
- Action Research, participation/networking, ESD-schools, learning environments, mainstreaming, developing curriculum, dynamic qualities, dynamic networks, conferences, teacher training, connecting research/teacher education, administration and schools.
- The key word for Sorrila has been balance: acknowledging the objectives for sustainable school, but developing in the speed and intensity that gives the whole school community a feeling of self steering. The principle of sustainable school development is based on the tacit knowledge and collegial memory of the staff and avoiding 'change addiction'.
- Sustainable development should lean on sustainable life style and learning in schools should lead into responsible actions now, not in the future. The needs for human beings can no more be only personal but common sustainable future for the Earth as well as the human kind. We are facing a challenge no one can meet alone. The most urgent task is the climate change.
- During the project years Sorrila developed into an ESD-school of its own kind.

The research results show how the school was able to accomplish the targets of ENSI-project. The experiences tell how developing projects can be turned into a process which grows from the school's own needs. Being an ENSI-school Sorrila has been able to benefit from several networks, local, national and international (SEED, Support, WWF). The learning and developing took place in the framework of ESD in its widest meaning, connecting ecological, sociocultural and economic aspects. ENSI gave the outlines but the school made its own solutions in balance

with the school community. The ongoing learning environment developing project 'Encounters' is in line with ENSI/Support targets and objectives and part of the lasting developing process.

Summary
Schools should develop learning environments that make each person's optional learning possible. They help each learner find his or her 'niche'. We should find new solutions how learning enhances sustainability in the schools in the way that is in balance with the needs of the members in the learning community. Success factors as well as things that make developing difficult can make us learn and find new aspects. We should seek for answers how learning environments can support ESD and sustainable way of living in the schools. Workshops should be based on collaborative knowledge building and bringing out each participant's experiences and best practices for all to learn in a win-win setup.

Engaging schools into reflection on the quality of ESD. Building an ESD curriculum framework in compulsory education: a collaborative project

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This paper aims to present the process of a collaborative project on developing an ESD curriculum framework that involved different educational agents. This project was founded in the following main ideas: (i) the need on developing an ESD framework for schools; (ii) the acknowledge of the teachers' empowerment to mainstream of education for sustainability; (iii) quality on ESD is a contextualized process.

Many green schools programmes have been implemented at national and international levels with the goal of integrating environmental education/education for sustainability in their educational principles and their management. Within the Catalan context and the framework of Agenda 21, the Programa Escoles Verdes (PEV) (Green Schools Programme) was launched in 1998, supported by the Ministry of Environment and Housing and the Ministry of Education of the Government of Catalonia. This programme has a whole-school approach to sustainability and aims to help participant schools into the mainstreaming of education for sustainability, to identify schools committed to environmental improvement itself and to set up a school network (233 schools on 2007)-

However, the PEV had not issued a public document in order to offer a contextualized definition and characterization on ESD or strategies on how to go on with a whole-school approach to sustainability. Another point to take into account is that although there are curriculum greening proposals and initiatives at the level of compulsory education, the school participants in the programme have been emphasizing school projects more related to the management aspects (reduce waste, energy and water, transport and mobility) than to the development of an ESD curriculum. This deficit had to be overcame (Catalan Strategy of Environmental Education-ECEA, Martí 2003).

In the other hand, according to Hart (2003), teachers' personal practical knowledge has been regarded as idiosyncratic and of lower status than external knowledge, particularly ideas

coming from outside the profession. Curriculum materials and educational policy have generally been produced by others without the time and the support needed for teachers to implement new approaches with understanding. It is small wonder then that while teachers acknowledge the irrelevance of general educational theories in helping them to address everyday teaching concerns, they don't see the power of their own ideas. Only very recently have educational researchers started to genuinely value and respect teacher knowledge as educational theory. Only recently have methods of inquiry found ways to acknowledge the significance of teaching episodes and teacher thinking as a basis for understanding.

Finally, the school community has to experience its own quality process on ESD. This process will find and learn from useful theoretical references and practical experiences in other contexts and educational centres, but it should be build in and by the school community.

Regarding these ideas it was understood there was the need to carry out a research work involving teachers, university teachers and researchers and the corresponding educational and social agents with the following objectives:

1. **Defining the concept of curriculum greening within compulsory education.**
2. **Characterizing curriculum greening at the early, primary and secondary education.**
3. **Identifying strategies for curriculum greening in schools.**
4. **Designing and articulating a process of participatory research.**

The participants were: 1 Kindergarten; 8 Early and Primary Schools; 11 Secondary Schools;1 Environmental Education Centre (all of them within the PEV); representatives of the Ministry of Environment and Housing, the Ministry of Education; members of the Catalan Society of Environmental Education and reserachers from the Research Group on Scientific and Environmental Education (GRECA,University of Girona)

The GRECA acted as coordinator and provided expertise resulting from its experience as a partner in two curriculum greening networks at the university level -the ACES International Network (Junyent & Geli, 2003) and the ACEU National Network- and as organiser of relevant activities in the field.

The research work was situated within the theoretical-critical educational research paradigm and followed a process of participatory action research.

The working methodology employed emphasised a reflective, interdisciplinary, collaborative and participatory dynamic aimed at building a common project among the various participating

educational agents. Working in groups was fundamental to the creation of a climate of constructive interaction, debate and dialogue, where everyone feels comfortable enough to communicate their experiences, make contributions, and be receptive to the ideas and points of view of others.

The work plan was structured into three seminars (during 2005) and the working processes between them. It was decided to work on two-day seminars in order to offer spaces of social relation among participants which could facilitate a good work atmosphere.

The seminars were organized into: plenary working sessions, group work sessions, revising theoretical references, lectures/workshops from "experts", work on provisional and final documents.

Working processes in the schools and the other entities were carried out between seminars. So each provisional document elaborated in the seminars were discussed and modified in the educational centres. The new ideas were brought to the plenary. The work in the educational centres was crucial for achieving the objectives of the project and for involving the whole-schools on it.

The project results, according to the objectives were: (i) a definition of curriculum greening; (ii) a characterization of the curriculum greening; (iii) identifying pedagogical and political strategies for ESD (Geli, Junyent, Medir & Padilla, 2006).

Definition of Curriculum Greening
Curriculum Greening is a process of reflection and action aimed at achieving education for sustainable development throughout the curriculum development, closely connected with the management of the teaching centre and intended to promote a more just, equity and participatory society.

Curriculum Greening must allow the analysis of the social-environmental reality and the search for alternatives consistent with the values of sustainability. Curriculum Greening includes all areas of knowledge and promotes collaboration with different institutions.

Curriculum greening involves acquiring competencies of systems thinking and promote the responsibility, the commitment and the action of the educational community towards the development of its own environmental identity.

Characteristics of the Curriculum Greening

- Methodology that generates creative, critical and supportive thinking and action
- Greening the strategy documents of the centre and of the educational administration
- Coherence and contextualization with a sustainable management of the centres
- Communication with the educational community and the community at large
- Assessment and evaluation processes coherent with an environmental thinking
- Participatory action and the involvement of different stakeholders and institutions
- Individual and collective work on a local and global scale
- Describing and implementing shared strategies for educational action
- Interpreting reality as a complex and changing system
- Interdisciplinarity and incorporation of an environmental dimension in the contents
- Building a process which is flexible and adaptable to the centre's own reality

Reflections about the process

Assessment provided by the project participants, through open debate, clearly indicate the following strong points and the difficulties about the process carried out:

Strong points

- the work structure, organization and methodology employed
- the participation of experts who provided new perspectives and knowledge
- the use of theoretical documents which facilitated and given direction and precision to the work
- a key concept was assumed: the importance of a theoretical basis for effective practice
- Collaboration among educators from various levels - early childhood, primary, secondary and university – and the participants from public administrations and other bodies working in the same field is motivating, enriching and effective.
- The working experience has been a process of self-training, conceptual clarification and knowledge construction. The research itself constituted a process of creative reflection.

About difficulties

- Overcoming the limitations that teachers and professors experience in order to participate fully in projects like this.
- The conditions required to facilitate participation must be supported by educational administrations:
  - providing time and space during the school day to work on the project;
  - finding the human resources in educational centres to substitute the professionals participating in the seminars or in-service training activities;

- and establishing well-defined criteria to give credit to and recognise participation in this type of work as professional training.

Emerging questions arised from the final debate, mainly focused on the evaluation of the ESD curriculum as:

How will we assess the curriculum greening process? Which referents need to be known to direct this assessment? Will the defined characteristics and the strategies allow us to determine the level of curriculum greening in the educational centres? Which indicators could be defined in order to assess the degree of awareness/satisfaction of teachers and students? How are processes of value and behavioural changes assessed? Which assessment instruments must be used? What instruments must be created?

Conclusion

The working and research processes have led to a consensus about what is understood by an ESD curriculum framework in compulsory education and which are its characteristics. Curriculum greening strategies, consistent with the defined characteristics, have been identified to facilitate the connection between the theoretical context and educational practices. On the basis of participatory and collaborative methodologies, this work has also struggled through its own learning and self-regulatory process, developing and growing in terms of both the working methodology and the contents of the project.

The final document can be considered as a working document or a starting point for helping to other educational contexts building quality processes on Education for Sustainability.

Competences for Teaching ESD

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Several lists of competences to ensure and foster sustainable development have been compiled recently (Fien et al. 1998; De Haan & Harenberg 1999, Nagel & Affolder 2004; Tilbury & Wortmann 2004). ENSI has compiled Quality Criteria for ESD schools to give suggestions how a school can change and develop into a school for ESD. But how can the teachers make themselves fit to work in such schools, what are the competences required by teachers who are supposed to teach ESD? There are hardly any publications for professionalization for ESD.

The CSCT-Model

One of the few works on teacher competences is the model created by the EU project CSCT. CSCT stands for: **C**urriculum, **S**ustainable development, **C**ompetences, **T**eacher training. 16 Teacher Training institutions from 9 European countries developed a dynamic model of ESD competencies in Teacher Education as a framework for a competency based curriculum for Education for Sustainable Development for initial teacher training and in-service training institutions.

The model is the result of intensive discussions at 6 discursive meetings based upon the experiences of the participants from all over as well as upon case studies on ESD in Teacher Education delivered by every participating institution. The resulting competency model is an attempt to give some structure to the complexity of ESD (Sleurs 2008). Due to the concept of ESD as a regulative idea (Rauch 2004) the teacher competences are formulated as generic as possible, to serve as a framework for all kinds of educators for all subjects and target groups.

The notion of competence underlying the diagram is the definition of Franz E. Weinert which also served as the basis of the definition of the key competences of the DeSeCo Project - Definition and Selection of Competences – the OECD Project for defining key competences for a successful life and as well functioning society (Rychen & Salganik 2001, 2003) : *„The theoretical construct of action competence comprehensively combines those intellectual abilities, content-specific knowledge, cognitive skills, domain-specific strategies, routines and*

Dynamic model for ESD competences in teacher education
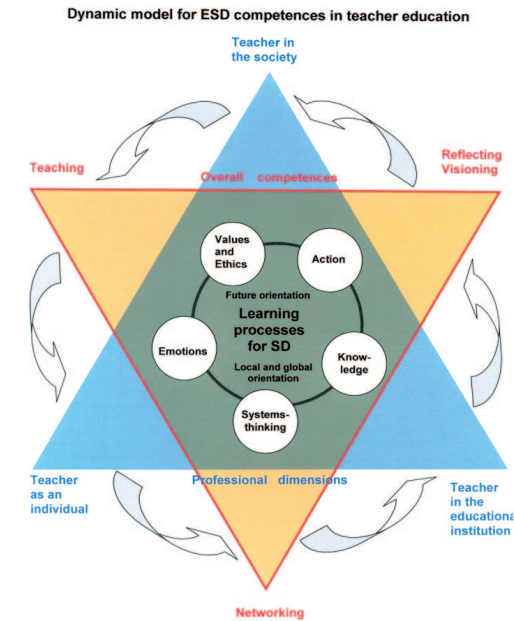
subroutines, motivational tendencies, volitional control systems, personal value orientations, and social behaviors into a complex system" (Weinert 2001, 51).

Another relevant aspect of competences are that they do not exist independently from action and social context, but are defined with a view to practical requirements and is proved by actions . Therefore it is essential for teachers that they actually get a chance to develop their competences in a real-world social context. In addition, Weinert (2001) points out that over the last decades team (and/or group) competences have also been increasingly referred to, in other words: the sort of interaction of individual competences that enables a group to solve a problem. ESD is one of the areas where cooperation and joint efforts are essential for problem solving. It is at too complex and demanding task, to be achieved by individual people. Building on the competencies and the experiences of a group of people far more can be reached.

Furthermore ESD is not a task of education only. In many countries it is common that the solving of problems of society is heaped on schools and education. We therefore have to be attentive not to focus only on personal abilities and motivations but also on surrounding frameworks and conditions. Supporting structures have to be created in which the competences can be developed.

In the CSCT-model three fields of work of a teacher (or a group of teachers) are addressed (the blue triangle): the classroom, the educational institution as a whole and the community. The teacher as an individual, the teacher in the classroom and the teacher in society.

We have to envisage teachers as individuals who are in a dynamic relationship with their students, their colleagues and the wider society. It is within this dynamic relationship that we create the conditions that enable genuine learning to develop and progress in ESD. This means that teachers are no longer simply the communicators of knowledge, but members of an institution, which has a collective focus on the way all its members learn and develop, and all of those people are involved in the dynamics of a society that is seeking to confront the issues of sustainability. For all these levels teachers need specific competences, which are explained with the five domains.

Three overall competencies are identified (the red triangle): **Teaching and communicating – Learning** is understood as a self-steered and active process, which can be fostered but not created, according to the concept of constructivism. **Visioning** and creating new perspectives are important tasks because the transformative role of education is a key issue in ESD. Action will change as a product of **reflecting** and visioning. An effective tool to foster reflection and visioning in order to improve teacher competences is action research. **Networking** with partners in and out of school is necessary in order to create a learning environment of real life problems and issues in society. For this overall competency also communication, conflict solving and team competences are necessary as well as planning and organizing skills.

In the inner-circle of the model we identified **five competence- domains,** of which each must have a specific profile for ESD. Even though these domains may appear as separate elements in the graph, they interact intensively and are in reality inseparable. Therefore overlapping was inevitable. The following short description introduces the reader to the five domains.

Knowledge: As specific features of knowledge for ESD we defined: conceptual, factual and action related knowledge. Knowledge has to relate to time (past – present – future) as well as to space (local – global) and it is inter-, trans-, pluri- or cross-disciplinary constructed. Knowledge is constructed by each individual and has developed with all the experiences in each life and thus also the social structure of knowledge has to be taken into account. The viability of our knowledge determines its quality. Critical thinking is indispensable.

Systems thinking: The complexity and interconnectedness of today's world asks for thinking in systems. There is an increasingly shared view, that analytical thinking and reductionist thinking are not sufficient to envision a sustainable future or to solve the current problems. Different kinds of systems are addressed: biological, geographical, ecological, political, economical,

social, psychological etc. including interrelationships in time and space. It implies the awareness of being part of the living system "earth" in space and time.

Emotions: Thinking, reflecting, valuing, taking decisions and acting are inseparably tied with emotions. Emotional competence is therefore indispensable for ESD-commitment and processes. Empathy and compassion play thereby a key role. Feeling inter-connectedness with the world is basic for intrinsic motivation in ESD.

Ethics and Values: Norms, values, attitudes, beliefs and assumptions are guiding our perception, our thinking, our decisions and actions. They also influence our feelings. The main guiding principle of ESD is equity (social, intergenerational, gender, communities …). Equality between man and nature is explicitly included only in some SD-concepts. The „Earthcharter" (www. earthcharter.ch), officially recommended for ESD by the UNESCO is an exceptional example for a declaration of fundamental ethical principles for building a just, sustainable, and peaceful global society for the 21st century.

Action: Action is the process, where all the competences of the other four domains merge to meaningful creations, participation and networking in SD. It needs additional special practical skills, abilities and competences in the field of project management and cooperation.

The model KOM-BiNE

In the course of a research project commissioned by the Austrian Ministry for Education, Sciences and Culture (Rauch, Steiner & Streissler 2007, 2008) and a PhD-Thesis (Steiner 2008) the CSCT Model has been further developed shaped as a three dimensional grafic.

In the core of the model there is a team of teachers or educators for ESD. We have explicated before - that especially in a field like ESD it is not possible for one single person to command all the competences required. Mutual support within the team and a network extending into
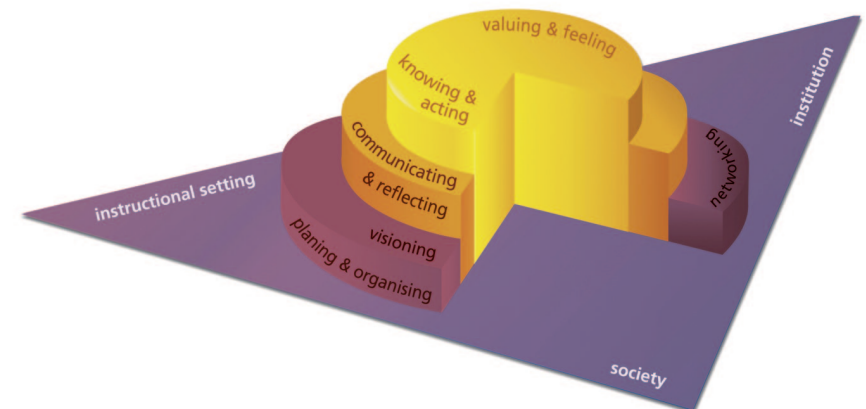
the environment are of special importance here. Only by the interaction of different persons and their joint utilisation of individual fortes and abilities can the requirements for ESD be met in the best possible way.

Like in the CSCT model the basis is the assumption that action of teachers in ESD occur in 3 areas. In the KOM-BiNE model we have extended the group of people addressed to ESD-educators of formal and non-formal education. Educators put their competences to use in three different social areas: (1) the instructional setting, i.e. a school-education, courses for adults, or non-formal teaching–learning situations; (2) the educator's *own institution,* e.g.: team of colleagues in school or NGO; (3) the society, i.e. the institutions's environment, both near and far.

The inner cylinder contains highly personal elements, subdivided in three parts: knowing as knowledge of facts or content on SD and ESD and knowledge of methods (domain-specific knowledge with respect to ESD), valuing (clarification of and dealing with values), and feeling (being aware of and dealing with emotions). All three are closely interconnected. Reflecting and communicating are seen as connecting parts and concerning all other aspects. Reflecting is indispensable to one's critical review of oneself, of one's knowledge, values, and sentiments. But reflection is also an essential prerequisite of action, i.e. of manifesting one's personal abilities and skills to the outside world. It is obvious that communication is necessary for planning, organizing and networking. But for ESD it is also important to be able to communicate values and feelings. In the outermost circle of the diagram and thus in the area closest to the social fields of action the activities visioning, planning, organizing, and networking are located. Planning and organizing denote the development of visions and plans as well as the appropriate steps towards their realization.

The models intend to facilitate the restructuring of existing as well as the planning of new ESD programs for teachers by helping to link all the different areas and fields of action. Possible questions for planning curricula for Teacher Education could be: Does the course sufficiently support critical reflection on existing and newly aquired knowledge? Is there enough space in the course to deal with values and feelings aside from constructing knowledge? Do the participants of the course get the possibility to develop their own ideas and plan their own projects? Is communication and networking among participants of the course and with people and institutions outside possible?

Both models are to be seen as "learning concepts" (Heinrich et al. 2006). This means that in the course of putting any ESD program into action they will be constantly developed and new experiences will feed this process. In other words, the concepts themselves will turn into objects of reflection and ongoing development.

Competencies for teaching ESD. Systematic development of ESD- Competencies. The portfolio as a tool for working on individual and team competencies in schools

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In the workshop the two models of competencies were compared and a competence portfolio were presented. A discussion was started about how they can be used for personal or institutional documentation and acquirement of ESD competencies. In the discussion an idea of a web-based portfolio with visualized case-studies in form of video clips emerged.

The comparison of the two models of competencies (Sleurs, 2008, ed.; Steiner, 2008), presented in the keynote of Prof. Franz Rauch and Dr. Regina Steiner, show similarities in the three levels of action for ESD teachers, in their dynamic, in the description of the competencies and in giving equivalent significance to values, emotions and knowledge. They differ in the graphic concept (two or three dimensions) and have either the learning process or the team of teachers in the centre. A further difference is that in the KOM-BiNE model a few competencies are placed in different areas and system thinking is integrated in "knowing".

The department of pedagogic of the University of Applied Science of North-western Switzerland works with a competence portfolio for teachers since 4 years. This portfolio allows teachers a self arranged accounting of abilities and attainments and a purposive altercation with one's personal career. The document consists of a part that shows the progress of learning and a collection of relevant qualifications and certificates.

Competencies show in the quality of performance. They become obvious in what we do and they can be indicated by the observation and the description of competent behaviour in different specific and real situations. The management of competencies follows the circle of quality and the principles of action research.

The portfolio of competencies is a positive concept that assumes that personal and professional development is possible. It fits very well in with the ideas of ESD and might be a helpful instrument for the systematic development of ESD- competencies

The documentation of competencies can be done on an individual level, within teams or at the level of the organisation (see figure attached). For all levels, a profile of ESD competencies, serving as a frame of reference, has to be worked out from the two models.

At the beginning of the workshop the portfolio was in the focus of discussion. Different forms of portfolios and their function have been cleared. There was consensus, that using a portfolio in a school needs a constructive setting and a culture of confidence. Teachers and schools are not yet used talking about competencies. To present them to their colleagues or to the head of school is delicate and asks for great sensibility and carefulness. The portfolio itself is not very common as an instrument and research on the use and the effectiveness is rare.
Concerning the two models of competencies the group agreed that the models are helpful to understand ESD but to make them useful for teachers definitely needs supplementary work and development.

Most of the models and tools already developed for ESD have not yet reached teachers and schools. The focus for the next steps therefore is dissemination and implementation. For this the models and instruments must be transformed in a language that teachers can understand and work with. Illustrative examples should be compiled.

The list of competencies of one domain of the CSCT-model was then discussed in small groups. The aim was to focus several competencies into one meaningful core-competence. Additionally examples for illustration of such competencies were collected and described. Therefore attractive stories and video-clips showing everyday teaching situations might be helpful.

Working with a portfolio on ESD competencies in schools was considered to be a possible way of implementation. But it has do be considered, that an ESD portfolio, in comparison with a language portfolio, is very complex and touches the values and the personality of a teacher. This is a very sensitive topic that might provoke defence and opposition in a team. Nevertheless the workshop-group agreed that in teaching, especially in teaching ESD, the personality of the teacher is most important. Working on values in the classroom demands that teachers are aware of and reflect their own values. Teachers can never teach without communicating values!

Form this, the question emerged, how teachers could be motivated to reflect and discuss their personal attitudes, how they can be invited to work with a portfolio and how a culture of confidence and exchange in a team can be build up. The group agreed, that here fore the support by the school authority is absolutely necessary.

Out of all this the idea was born to configure a web-based portfolio with visualized case-studies in the form of video clips and real-life-stories. The competence-portfolio itself should be tested also in countries beside Switzerland. For this the instrument has to be translated. Additionally it should be examined what sort of portfolios and which settings to assess competences are already used in other countries and contexts and what one could learn out of them. The list of competences formulated in the two models finally should be concentrated and illustrated. For this a group of both teachers and teacher trainers should work together. All activities described above could be the topic and objective of a future Comenius project that should help teachers and schools to improve in teaching ESD.

Key issues:

- Comparison of the two ESD competency models (CSCT and KOM-BiNE)
- Suggestion of possible ways for implementation: adapt and illustrate the models of competencies for the use of teachers.
- A portfolio of competencies as an instrument for systematic development and documentation of ESD- competencies
- Discussion of a web-based portfolio with visualized case-studies in the form of video clips and real-life-stories.

Figure: Managing competencies on different levels

Teacher as an individual and in the context of his/her teaching activities and their interactions with the students	Team, group of teachers, tandem, etc.		School as an organisational unit focusing the quality criteria of an ESD-school
Personal management of competencies, working with the individual competence-portfolio.	Sharing their knowledge and their experiences and supporting each other in improving teaching ESD. • Acting as a critical friend. • Building a frame for regular reflection and exchange. • Showing each other the individual progress and the improvement gained in teaching ESD.		Management of competencies, working with the competence-portfolio for the school. • Definition of what exactly has to be achieved. • Coordination with other running school projects and with the effective quality criteria of the school. • Description of what has to be done to achieve. • Description of the competencies necessary to achieve.
• Analysis of stock of competencies: Personal documentation and proof of actually existing ESD - competencies: Actual profile of individual ESD-competencies.	information out of the individual portfolio-processes		• Analysis of stock of competencies: Documentation und prove of actually existing ESD - competencies in the team as a whole: actual profile of ESD-competencies in the school. • Comparison of what we have and what we should have.
• Working on continuous development of ESD- competencies.			• Working on continuous development of ESD- competencies as a school: Deciding, which competencies have to be gained or increased.
• Planning and implementing individual measures for improvement in teaching ESD.	• Coordination, agreement concerning the development of special ESD-competencies.		• Planning and implementing measures for improvement in teaching ESD. and moving towards an ESD-school. Coordination and controlling by the management of the school

Reflexions on Workshop D: Portfolio as a possible tool for developing ESD competencies of teachers

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The focal point of the workshop was to examine whether portfolio could be a useful tool for developing competencies of teachers in context with ESD and share ideas about ways of implementation of such a tool. Some suggestions sketch out a possible future research project and offer technical solutions for implementation.

A quality education and especially such a complex one as ESD requires good teachers, thus we find it vital to outline competencies that enable teachers to be able to fulfill their role successfully. It is also important to note that in many European countries researching teachers' competencies became a mainstream field of interest as it is coherent (and inter-dependent) with endeavor to harmonize schools and implement and develop competency-based curricula. Becoming a successful teacher of SD involves many competences and as this type of education is value orientated and affects emotions and attitudes it requires a high level of awareness. Teacher can enjoy the activity they conduct if they are confident with their roles. In classroom situations the more aware one is of their strengths the easier can avoid unwanted and unintended situations which change the message. On the other hand many teachers are more apt to be conscious of their weaknesses and the discommodities than willing to address points to rely on, which might be one of the reasons why dealing with such problems in classrooms or using effective methods involving emotional feedback (including art and drama) are still less common. One way of facilitating ESD can be raising self-assertion of teachers by promoting a paradigm-shift of considering metiers. To be more self-assured in any field of life also involves keeping fitness by continuously training and developing the competencies we already have. An easy way to achieve this perpetual maintenance is getting into the habit. Why should it be different in the case of education?

Two models (CSCT and KOM-BINE) introduced by keynote speakers and then further clarified in the beginning of the workshop (together with that of on "TA model of competencies for teaching ESD - and now? Methods and experiences in gaining competencies") served as a basis of debate. It was stated that the conception of ESD used in these is consistent with that

of in the UNESCO documents. In this context we aimed to examine if the Kompetenzmanagement portfolio, which focuses on general competencies, can be a useful tool for ESD and initiate further thinking and co-operation on the problem.

As a starting point the participants of the workshop agreed that the two models provide a similar approach to competencies and in spite of some important differences they do not contradict one another and neither do they exclude the usage of the other one. The portfolio as a tool could also be used to develop either individual or team competencies. Nevertheless, the participants decided to concentrate on the level of the teachers as individuals also noting that the same approach could be extended to the other levels as well. We declared that teachers of ESD should be aware of their competencies for mere professional reasons – that is: their personal engagement, reliability and harmony with transmitted content and approach is their most important working tool.

Our hypothesis was that the portfolio is a useful tool for developing ESD competencies although it is a more complex field than those that we had positive examples or experiences of working with similar tools (for instance the European Language Portfolio). This is supported with the notion that the portfolio was designed to carry the message of a positive and active view of teachers and provide users with specific, practical goals and steps to achieve. Thus the users are enabled to use school situations to show different perspectives related to topics of sustainable development. This way it may help policy-makers to cope with the defensive attitude of teachers (which usually focuses on deficits) that (as an "avalanche of avoiding") often becomes an obstacle to progressive ambitions to renew education.

By testing the CSCT competencies in three different domains the participants found that these could be applied to ESD and were also able to support this with examples and experiences from practice such as Storyline approach, local projects on rubbish and so on.

Thinking about the implementation of the portfolio itself, the most important remarks included the need for convincing and encouraging teachers of using the tool making it attractive and important to them at the same time; putting emphasis on sharing competencies (thus ensuring teachers that colleagues are in fact interested in their competencies as these could provide the basis for co-operation on institutional level) and establishing a trustful and safe approach, atmosphere and setting for an open talk about individual competencies; ensuring that current stages of competencies would not become a basis of ranking teachers either at institutional or on any other level (stressing the importance of providing trainings for school-leaders); the technical possibilities and the need for translation of national languages making it widely available and easier to use.

Further research is needed to pilot with the portfolio in different cultures and compare results to tailor it to national environments. Accomplishing cultural comparison is the basis of adapting the portfolio as a tool in different school systems. This would include translating into

English then into some national languages so as to make it widely available and also to avoid pre-selection of users by language. As a next step, testing with participants on a voluntary basis would mean a proof of translation as well as applicability. At this stage, the need for commitment to clear the status of affected people (teachers, teams, headmasters) and the stress on voluntary participation is equally crucial. This should be complemented by interviews with teachers as it is important to have follow-up studies to prove it ESD competences can be improved by using portfolio. Making interviews are also relevant as follow-up studies and systemic analysis of individual development case studies are not available on the topic at the moment. National inquiries should be followed by roundtable meetings where stakeholders could clarify details and make suggestions about the opportunities and technical details of possible implementation. The maintenance of the system lies in how willingly teachers share information of their own progress. As this requires special circumstances in institutes, we find it a key question to provide frames for a school atmosphere and proper setting where communicating their level of competencies become helpful means rather than a bothersome and frustrating obligation.

As developing the portfolio intended to embrace general competencies, the innovative idea of using it as a tool for ESD also requires further theoretical and empirical research. Concentrating on complex topics and specific methods we should differentiate competencies needed for teaching for sustainable development. The participants of the workshop agreed that the research should be completed by involving teachers and teacher trainers in the process and follow-up studies could supplement these. We have to find ways to reach schools to be able to explore ways of using the portfolio in different settings and shape the frames of competencies. Hence I would suggest action research as a suitable method for this. It is also important to remark that the research could only have any relevance if many teachers tried and used the portfolio – so making the tool user-friendly and easily available can establish the success of the process.

Therefore workshop participants came up with an innovative idea (taken from a research sub-project on curriculum-analysis concerning IBST and scientific literacy) of creating a web page with short video-clips illuminating the importance and practical usage of different competencies as a resource of ideas and also a tool for empowering future users. It is worth noting that material for possible use for such purposes is already available from many sources. The web page with downloadable versions and portfolios available on-line could offer a learning platform for those ready to get involved in the process. Electronic versions have other implications. First of all, the present version that is a folder with some 80 pages is more difficult to use at any time or makes it less favourable for teachers to carry home. Secondly, tools themselves may carry significant messages and these are especially worth considering when we use the for ESD. Thus a paper-saving option might be object to consideration.

The web page would open opportunities for open forums of sharing experiences that might establish further debate and could serve as a collection of feedback available for research.
Users could be supported by mentoring system as well as brief case descriptions on specific competencies. As for the latter, it is an ultimate requirement to be real-life, practice-based and realistic in a sense that they include difficulties too. Some experiences on participants' side confirmed that early mentoring helps the user to get into the regular habit of using the portfolio which is a key factor of avoiding that it becomes an extra burden over the teachers' workload. Mentoring would also be necessary as an early control for regular use and feedback as the very content of each individual portfolio is not public by its nature so it would mean possible difficulties (thus mean uncomfortable situations) for school leaders to keep track of the process.
The positive examples provided by those giving feedback on fruitful testing could support the idea that using the portfolio is not time-consuming and would also motivate other teachers in using the tool.
The most important outcome of conversation in the workshop may be the idea for a new co-operation that might be the continuation of CSCT. The draft of the research plan is built on the comparison of the two models of teachers' competences (CSCT and KOM-BINE) in context with ESD as well as further research on ESD-related competences in the light of the models. Before re-designing the portfolio to harmonize with ESD a comparative research is suggested on other examples of using such a tool (from other fields of education but also from other sectors such as business sphere). In the piloting phase the portfolio could be tested in various countries to shape up cultural differences that must be taken into account when making national versions – there can also be strong differences between teachers' requirements and ideas bout "useful" ESD competences as well as between their level at those. This would be complemented by action research on an ESD-related portfolio on competences involving practicing teachers and headmasters. In this phase establishing a learning platform would help assessment by serving as a database for feedback (through forums, for instance) and later to disseminate results. Finally initiating debate on using the portfolio (involving stakeholders from different levels of education) would facilitate successful implementation.
Many participants in the workshop expressed their volition to participate in the future research project and offered contribution in the process.

As a conclusion, the workshop proved to be very productive as it brought about new initiatives for further research as well as important ideas about possible implementation. We hope that further research will establish that the competency portfolio is tailored to ESD and that way we can contribute to empowering teachers in their professional role as well as improving quality of education for a sustainable future.

A model of competencies for teaching ESD – what now? Methods and experiences in acquiring competencies

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Prof. Franz Rauch
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The workshop focused on methods and settings for teacher training in education for sustainable development. The group looked at possible ways of acquiring and assessing competencies and reflected on some specific competencies listed in the models.

Barbara Gugerli-Dolder started with the description of a workshop following the CSCT-Model during the «Impulse Study Week» for ESD in March 2008 at PHZ Lucerne. 500 students participated in this week. About 30 different workshops were offered over four days, one of them on the CSCT model: The model and each domain (knowledge, systems thinking, emotions, values/ethics and action) was presented with an activity/experiment that both provided an experience and represented a didactical method. Theoretical information about the domain provided background knowledge. The students had to choose a topic for their proof, working in pairs. They prepared a poster with a mind map on the topic in relation to SD in the centre, surrounded by each domain and the necessary teacher-competencies. At the end of the week they presented a short activity on the chosen topic and explained their poster. A questionnaire at the end showed that the students felt fairly competent in the five domains.

Franz Rauch briefly presented a four-semester university program for teacher educators called ″Innovations in Teacher Education – Education for Sustainable Development″ (BINE) in Austria offered by the University of Klagenfurt and the FORUM Environmental Education (an NGO). The goal of BINE is to encourage participants to deal as a ″community of learners″ with substantial information on sustainable development (SD) and on education for sustainable development (ESD) in a reflective way. Participants will also be trained to complete research projects within their own practical experience (action research). This course was also examined within the research project Competences for ESD in Teacher Education (KOM-BiNE). The KOM-BiNE Modell as an outcome of this project was briefly described (see keynote by Regina Steiner & Franz Rauch in this volume).

The 12 participants perceived both models as helpful and inspiring – like a vision of an «ideal EDS-teacher or team». The long lists of competences for each of the five domains was criticised

as overwhelming, and strategies were developed on how to cope with it. One group proposed using the strength model: identify strengths of the teachers or of the institution as a whole in the present moment. Define the competencies you want to acquire next and set priorities. Another approach could be that the school team as a whole tries to cover a range of different competencies, and each teacher contributes with his or her own profile, building up specific competencies step by step. This requires a systemic way of organizing a school and its education and professional cooperation. The question came up of whether teachers would apply the ESD-competencies, especially when their learning environment is not suited to it.

A very positive side effect of the use of competence models is that with a system of competence built for ESD, the educational community should become more aware of the fact that it contributes to the shaping of the – still rather fuzzy – SD-concept. It also became clear that ESD constitutes more than just new content in education. It is a possible vehicle for basic reflection on goals and methods in education. It could be a trigger for a fundamental shift of mind, but as a pre-requisite, substantial reforms in the education system are needed at all levels. Competencies in the sense described here require so much from the teacher that he/she should be enabled - already at early stages of the professional training - to practice with different situations in which these competencies are needed (e.g. handling an unsafe atmosphere in a class).

The discussion on the domains of the models showed that there are substantial language differences between them. Each language needs a special effort to be understood – it is important to understand each other. The strong interrelationship between the domains has to be explained in more depth.

In the following, some of the results pertaining to each of the domains are presented.

Overall competencies: Networking might overburden schools. It is expected that this role will be fulfilled in one's spare time, and thus it is an extra burden on top of the many existing obligations within the school. This is not only undesirable, but also impractical. There are institutions on the local level (like EE centres, volunteer groups in EE, public institutions such as support centres for schools, museums, etc.), which are much better equipped to do this networking.

Emotion and feelings: This domain was perceived as very important as well, and has recently shown up in many other fields. Emotions and feelings evolve into consciousness, which can lead to action for SD. However the question came up of how realistic is it to work with emotions in school? How can we overcome the barriers to showing our feelings? How would we deal with anger and hate? If dangerous feelings come up, is a teacher able to cope with it without being a psychologist?

Is there a danger of instrumentalizing emotions? Certainly, teachers need special training for this domain; this is often missing in teacher education, and would help them personally, as well.

As a method, it was proposed to use world current events, films as well as encounters in nature, to provoke emotions and feelings. Students express their feelings about the events and reflect them. In the following, the problems should be analyzed (impact on the environment, the economy and society, ethics) and students should investigate possible actions. In this regard, emotions can lead to action. Working with emotions/feelings demands a safe atmosphere. Students should be invited to open up to each other. This requires building up trust within the class. Will it thus be necessary to work in smaller groups?

Values and ethics: To allow an open communication on values, the teacher has to create a safe atmosphere – similar to working with emotions and feelings. This depends on the relationship among pupils, as well as between teacher and pupil. In the teacher training, this can best be taught by exposing students to a training situation, which is similar to a "safe" class-situation. To clarify and build up one's own values regarding SD, the teacher must be able to bring up and discuss the issues of worldwide justice and care that need solutions. The teacher has to be convinced him/herself of what he/she believes, without imposing it on the students. For this he/she has to know him/herself well and to be aware of how he/she performs. In this context inter-vision groups (within the school or with other schools) are very effective – teachers learn from each other.

It is a legitimate question whether this kind of teaching is possible in 45-minute lessons, with a different teacher for each subject. Would it be possible to integrate it into each lesson?

Systems thinking: How does the ESD-system relate to the school system? How will it be possible to link the ESD to school reform? The group was convinced that ESD has the potential to improve education in general. The long list of competencies for this domain seemed especially overwhelming. Besides the strength model mentioned above, participants in our workshop found it important to define which systems are of major and which of minor importance in relation to SD. It also needs a systemic approach to the various disciplines.

Two questions arose: How do we build wisdom? How can we move on from data collection and accumulation of information?

Two methods were proposed for avoiding over-simplification: Debating on issues like "Buy locally!". Start with a debate, try to discern when you know enough, then undertake an initial vote and debate again and vote again, and finally, write a reflection essay. For understanding power relationships and interactions and for clarifying complex issues, it was perceived as crucial to bring in expertise from outside (NGOs, universities…).

The five domains of competence are connected to each other and influence each other therefore they themselves should be recognised as a 'system'.

Knowledge: Sometimes we take knowledge too much for granted. Is there a specific or characteristic ESD-knowledge? In the ecology field this knowledge is well defined (environmental literacy), but, e. g., there is no such thing as «social literacy». Some knowledge has to be site-specific, while other knowledge is global.

In striving for inter-disciplinarity there are two constraints: on the one hand there is little co-operation between teachers of various subjects (above all, in secondary schools); on the other, curriculum core objectives are formulated in such a way that they either relate very closely to single subjects, or else are so open-ended that a teacher can accomplish it according to his/her own interests – or not at all.

Looking at the list of competencies, there is a strong focus on the teacher as an individual, and not so much on the teacher in the institution and in the society. The list is too curriculum based. The knowledge should be focussed more on relationships and co-operation in the school team. Method proposals: Try to teach in a way that is coherent/consistent with the subject. That means not only speaking about the competency, but also practicing it during the learning process (whole school approach).

In initial teacher training, educational goals should be set according to their social, psychological, scientific, economic, and ecological relevance. Knowledge has to connect the past and the present by, looking at issues from a historic perspective as well as the present.

Action: As a starting point we have to take into account that teachers are afraid to leave classroom and subject, and to go out into the community to deal with reality. How is it possible to overcome this barrier? One strategy could be facilitating networking among teachers and with partners from outside (NGOs, community administration, experts from companies…). This includes raising awareness about the potential partners' interests and competencies (win-win approach). In needs facilitation of the process so it is also fun. Therefore a good facilitator is needed in the school team. This way learning by experience, learning by doing, by cooperating and by finding a common language becomes possible.

Ten participants were interested in a follow-up project condensing both competence models into one, identifying methods and settings for acquiring the various competences, and finding ways for assessment. The competence list has to be reflected and reduced to core competencies. Pilot projects in teacher training institutions and schools could evaluate the outcomes and collect examples of good practice and help to re-think the competencies. A collaboration with the interested participants of the workshop "Systematic development of ESD- Competencies. The Portfolio as a tool for working on individual and team competencies in schools" would be essential.

An international course using the two models could serve a starting point for a future project.

Workshop about Teachers Competences for ESD. Thoughts & Reflections about Research Perspectives and Practical Implementations around the CSCT model

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What kind of experiences did the participants have about teaching methods related to competences in the model? What contexts and settings were experienced as successful? How do we assess ESD competences?

When I look at these questions it seems like they almost describe the conclusions of the workshop. In a way my reflections return to the key questions that were posed in the beginning of the workshop. Those questions are still the most interesting ones for future development of the model and its implementation. What will come out when using the model? Since the model is newly developed it hasn't really been put into different practices yet.

The workshop participants were divided into groups representing "competencies". Examples from practice were shared. Most of the input that was given was about plans, ideas and reflections of how a good practice could turn out in the different areas of competencies.
It is good to have in mind that this model arises from case studies and action research. It is based upon the collaboration between eight countries and 15 engaged and experienced people's joint work. The model has been developed during three years of corporation, and is based upon a lot of experience from both practice and research review.

The CSCT model is developed with the aim to facilitate the integration of education for sustainable development (ESD) in the curricula of teacher training institutes. It is an attempt to look beyond the different subjects by focusing on overall competencies that teachers will benefit from while teaching for sustainable development. Those competencies are supposed to be shared by teachers independent of which subject they are representing. It is a model that focuses more on the "output" of teaching than on the "input".
The problem that the CSCT model shares with other complex models is the difficulty of simplifying a complex sphere in a way that it still can be interpreted in a holistic view. To

understand the model it is almost necessary to take it apart and interpret each of the different competences and levels of the teacher's dimensions. Then we have to put it together again and try to study the interaction of the different competences and dimensions. How do we transform this into the desired pluralistic approach with a teaching that includes it all? A lot of interesting practices remain to be studied.

If we focus on the different competencies by themselves, there are a lot of practical examples of how they are dealt with in the education and teaching. There is also education research studies dealing with teaching situations connected to the different competencies. How do we make use of the conclusions from research and practice in a way that will benefit the coming teaching situations? During the workshop, the guidelines in the shape of long lists of competencies, as presented in the existing handbook (Sleurs, 2008), were experienced as being exhausting. The fear was expressed that this could have a checking effect on the teachers since it appeared as if the teacher ought to be some kind of "supernatural teacher" with all those competencies. Is it possible to make some of the research conclusions as guidelines to reflect upon in a more inspiring way? Could it be a good idea to review them in some kind of popular scientific collection of examples? Is it possible to find some intermediate way between the lists of competencies and the reports from the case studies? How do we present them with fewer and shorter concrete examples?

The competences "Values and Ethics" as well as "Emotions" are perhaps the more recently accepted fields to discuss in relation to natural science. Öhman & Östman (2007, 2008) has presented some interesting research studies in the field of moral meaning-making. Those could for instance be valuable as guidelines for the competences of Values and Ethic and also border to Emotions. It is sometimes a challenge for the teacher to handle the balance of accepting free thoughts and emphasize a way of life that we interpret as supporting sustainable development. Here Öhman & Östman (2008) shows a way of practical understanding that can be of interest in the teaching situation. Öhman & Östman is discussing the differences in situations distinguished as moral reactions, norms for correct behavior and ethical reflections. This clarification makes a functional tool for awareness when dealing with moral and ethical aspects in school. Another of Öhman & Östman studies (2007) discuss the question of individual continuity and change in moral meaning-making. Öhman gives example of how prior experiences are re-actualized in an event and thus participate in the process of moral meaning-making, as well as contributing to the substance of the meanings made.
However, it is necessary to come back to the desire of integrating the competencies with each other and not treat them as separated. How do we handle this? The model implies that the different competencies influence each other. If we think about "Emotions", which is one of the

five competencies, one can realize that all the other competencies are affected by our emotions in the same way as "Values and Ethics" affect the other competencies. "Systems thinking" is a way to open up the reflection to a more complex and dynamic thinking, avoiding too narrow perspectives. Without "Knowledge" the other competences are left alone without content and ability of development. "Action" could be seen as the goal where all the competences comes together to be realized in the communication with the society. If we interpret the integration this way, maybe we should avoid making lists or conclusions about the separate competencies and instead try to find the good integrated examples through which we can recognize all the competencies. This would be a challenge for coming studies. In this context we will have to glance at the learning environments that make those competencies come together. Which contexts will fulfill those intentions? Hopefully many options will be found that can satisfy the various preferences of teachers as well as students.

When we put the model into practice it is hard not to be aware of problems about assessment. Are we able to assess the outcome of teaching? What is the outcome? Is it putting knowledge in a "real world context" which includes emotions, values and a complex interaction in society? Do we get students with ESD-action competencies? How do we know? How do we assess? Those questions remain to be explored.

Important to keep in mind is our western culture perspective of looking at competences, values, critical thinking and agents of action. When thinking of transforming the concept into different cultures and countries, it is important to be aware of the fact that the intercultural landscape is already present in many of our classrooms. To respond to cultural differences is not only a question about transmissions between countries, but also a question for the intercultural classroom. How we meet those cultural differences is of vital importance for the developing process.

Some questions that might be of interest for further investigations:
- Why are those particular competences in the CSCT model needed especially for ESD, in comparison to overall goals for good teaching?
- In what way can we show that those competencies are a way to make ESD imbedded in the overall curricula?
- Should we, and how could we assess those competencies? If we can't, how do we know that we are making a development?
- How could competencies and dimensions be mingled together in practice for their mutual benefit?
- Is the model transformable if we look from different cultural views?

The relevance of Leuven approaches from ENSI Junior Researchers' point of view

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ENSI Junior Researcher Group members first met in 2008 at a seminar about ESD. Beyond all presentations and workshops, with the kind but firm guidance of Michela Mayer and Johannes Tchapka, important personal collaborations started and a network began to be built. People in the first part of their professional careers found it overwhelmingly exciting to discuss their general dilemmas about sustainability, to discover how others struggle with some similar research problems, to share their views about teaching and learning from the ESD perspective, to learn about innovations and genuine actions carried out by others or to find out how solutions emerging from other disciplines may improve the quality of their own research and development activities. It was especially fruitful because group members (besides coming from different countries, having diverse cultural background) represented miscellaneous disciplinary areas (from sociology to engineering or science) and were engaged in the teaching and learning processes at various levels of education (from kindergarten to university). This lively interchange therefore gave participants ample munition to continue their work in their respective countries and fields and to answer some questions raised at the seminar, but it also served as a trigger for some to think about new ways of collaboration.

A year later, at the conference Junior Researchers got invited to participate as a sort of reference group. As a result, the conference itself transformed into a real exchange platform, providing unique occasions for creating learning environments for the future, also within our network.

Members of the Junior Researcher Group were invited to be rapporteurs of workshops, to present posters and some of them conducted their own workshops bringing abour new ideas and fresh approaches to ESD Consequently, the conference itself served as an intergenerational learning platform with a broad range of opportunities to share experiences and discover differences: members of the Junior Researcher group collaborated with ENSI senior advisers, conference participants, sharing enthusiasm, doubts and finding new questions. I personally remember how interesting it was to prepare for my task (with some anxiety, of course, to live up the task and to be able to give meaningful reflections to the ideas presented by high experts) and even before the conference how much I managed to learn. But the nicest memory of all turned out to be how open and eager these more experienced experts were to discuss

my thoughts and how vividly we engaged in discussions about our different aspects of practice. Based on the feedback from our partners and ENSI representatives, I might claim that members of the Junior Researcher Group (with the support of all participants) succeeded in making this conference a reciprocal learning exploit, which not only remains a pleasant memory but which empowers such future ambitions of professional exchange.

Thinking back to the purposes of the conference, I feel that ENSI managed to reach far beyond its original target. Future-leading ideas were presented and future-leading initiations were born from them. How can we perceive some of these outcomes now?

One aspect of this is that the Leuven Conference has inspired many of us not just to continue working on these topics but even to widen our collaborative network for proposing new plans, ideas and initiating actions for sustainability. Therefore (from the Junior Researchers' point of view), this conference represented an ignition for creating an exclusive learning environment for sustainability: in the new ENSI project CoDeS our group will learn from the networking process of some 28 partners that make inquiries about community-school collaborations for sustainability, using resources such as quality criteria or models such as ESD competencies or learning environments.

And that is another direct result of the conference. In 2009 a project called LEARN was initiated, which later resulted in establishing a learning network of researchers, teachers, community leaders, local authority representatives and NGO activists that now work together in CoDeS, searching for future-leading and long-lasting ways of community-schools collaborations for sustainability.

These future-leading ideas for schools are of an imperious necessity in the context of scenarios outlined by trend analysis (OECD, 2001). If we mean schools and public education to survive, it is crucial to reposition them in their meso- and macro-environment and to find new ways and new roles for community-school collaboration. But do we "mean" schools to survive? We consider public education as driving force for responsible actions for sustainability: public education represents a melting pot in our societies and serves as learning arena for exchange between members of different actors in society. Re-schooling scenarios would involve schools as "core social centers" or as "focused learning organizations". While the first case emphasizes strong exchange with local communities, the second one underscores the importance of new forms of knowledge building. Both these contingencies call for new approaches of learning environment. If we are to shape our present educational settings in a way that they converge to structures that survive and act for sustainability, we need to determine a set of factors that scaffold that change. Local communities may present various

ways and tools for becoming learning organisations that operate for sustainability. Therefore existing examples of such collaborations serves as an outstandingly important learning opportunity for the renewal of public educational scene.

Thinking about the future, on the other hand, requires paradigm shifts: one has to handle concepts and notions that are difficult to apprehend with our present knowledge and familiar frameworks. Doubts and questions can be useful companies on such a journey. The conference was again fruitful from that aspect as it raised many discussions about existing mental skeletons and innovative ideas or actions. Contributions included topics such as: what competencies students acquire to be able to meaningfully participate in shaping our future; what tools and competencies teachers need for guiding students through learning for sustainability; how actors on the scene can be empowered to continue participating in the learning process; what criteria could be applied to determine if a specific school or activity is efficient in the aspect of ESD; how to provide ignition for meaningful actions in learning for sustainability and what didactics and methods work for inviting a wide range of learners to join the learning process. With regards to learning environments, emphasis was put on mutual exchange and collaborative knowledge building that brings about genuine experiences. Learning for sustainability was interpreted as a journey which we are all invited to take part in.

In natural sciences, we often state that the most turbulent and exciting phenomena take place where surfaces meet. Similarly, interactions between entities that embody the environment and those that represent communication can result in relevant performances in environmental communication (Luhmann, 1989). At the conference, these interfaces did meet: communions or on the contrary, disputes between different approaches, between people from different scientific, practical, national and sociocultural background generated original an community of exchange. The interdisciplinary approach that invited us, participants for a shared inquiry, brought about real knowledge transports and resulted in a meaningful communication. The multidisciplinary approach, the different expertise brought by participants resulted in a fertile learning arena. As for Hungarian participants, it also gave rise to a project "Educating spaces", which using Manninen et al's model of learning environments focused on school building and established a set of quality criteria for designing or creating sustainable, inclusive school buildings. Some other participants gained inspiration to go further with their research topics, yet others found partners for new projects, new actions, new research.

ENSI has a tradition of whole-school approach. Now we experimented with a whole-conference approach. In other words: we all learnt something.

We hope that this publication will catalyze more thoughts and may inspirie for future work and joint efforts for creating future-leading present learning environments for sustainability.

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