CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT: THE RESPONSE FROM EDUCATION

December 2009
LIST OF NATIONAL REPORTS

Australia

Brazil
Jacobi, Pedro Roberto; Luciana Ferreira da Silva, Samia, Nascimento Sulaiman, Tiago Costa Nepomuceno, Lesly Montemiro Kattahus (2009): "Climate change and sustainable development: the response from education in Brazil: Laboratory of education and environment - TEIA-USP / School of Education / University of the state of São Paulo-USP.

Canada

China

Denmark

Korea

South Africa
Winter, Kevin (2009): Climate Change and Sustainable Development: The response from Education. Environmental & Geographical Science Department, University of Cape Town.

Singapore

United Kingdom
Blum, Nicole & Chris Husband (2009): Climate Change and Sustainable Development: The Response from Education in the UK Institute of Education, University of London.
In this report, we present the results of a cross-national analysis providing a broad international overview of the initiatives taken and the problems involved in achieving the goals of the United Nations Decade of Education for Sustainable Development 2005–2014 here at the midway point. Based on the findings of research teams from ten different countries spanning six continents, the report also provides a timely survey of the ways in which education can contribute to tackling the challenges of climate change. This is one of a series of publications resulting from the project ‘Climate Change and Sustainable Development: The Response from Education’ conducted under the auspices of the International Alliance of Leading Education Institutes.

The International Alliance of Leading Education Institutes was founded at a meeting in Singapore on 21st August 2007. Made up of ten leading institutions in the field of teacher education and education research (São Paulo joined in 2008 and Cape Town in 2009), the Alliance acts as a think-tank which draws together existing expertise and research in education to generate ideas and identify trends, to serve as a collective voice on important educational issues and thus influence policy and practice in education. It aims to inform governments, international agencies, funding bodies and the public at large, to influence policy and practice in education and thus to enhance the profile and quality of education internationally.

The Alliance comprises representatives from the following member institutes:

> **Graduate School of Education**,  
  The University of Melbourne, Australia
> **Faculty of Education**,  
  University of São Paulo, Brazil
> **Ontario Institute for Studies in Education**,  
  University of Toronto, Canada
> **School of Education**,  
  Beijing Normal University,  
  People’s Republic of China
> **Danish School of Education**,  
  University of Aarhus, Denmark
> **College of Education**,  
  Seoul National University, South Korea
> **National Institute of Education**,  
  Nanyang Technological University, Singapore
> **Institute of Education**,  
  University of London, United Kingdom
> **Faculty of Education**,  
  University of Wisconsin-Madison, USA
> **School of Education**,  
  University of Cape Town, South Africa

The core reason for the founding of the International Alliance of Leading Education Institutes was the recognition that education needed a “voice”, a group that would seek to offer well-considered and balanced advice on important educational issues. The group would be mindful of the views of academic researchers, of what evidence and practice had to say, as well as the needs for action on the policy front.

Each year the Alliance partners agree on an issue for a common research project in order to provide the basis for the think tank to formulate recommendations for the policy and practice level on how to qualify their efforts on this issue.

In August 2008, *Climate Change and Education for Sustainable Development (ESD)* was chosen as the issue for the next year and, as the Danish School of Education holds the Alliance chair position, a research team from this university was chosen to lead the project.

The nine other universities have contributed by establishing research teams who have conducted national reports providing the basis for the cross-national analysis.

In August 2009, the Alliance partners met at Seoul National University in South Korea and discussed the results of the cross-national analysis. On this basis, eight recommendations have been formulated to inform and qualify policy initiatives regarding climate change and education. These recommendations will be presented to the public at a press conference in connection with the Copenhagen Climate Change Summit, December 2009.

For the national reports and other documents from the project and for further information, please visit http://dpu.dk/RPEHE or http://edusud.dk/
ACKNOWLEDGEMENTS

We would like to express our warm and special thanks to the following researchers who have contributed by conducting national reports as input to the cross-national analysis presented in this report.

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- Associate Professor Jin Yi and Ping Wu, School of Education, Beijing Normal University, People’s Republic of China
- Professor Jong wook Kim, Chankook Kim, Namsoo Kim, Yisung Kim and Heekyung Kim, College of Education, Seoul National University, South Korea
- Professor Kim Chuan Goh, Kim Chwee Daniel Tan, Chew Hung Chang and Giok Ling Ooi, National Institute of Education, Nanyang Technological University, Singapore
- Dr. Nicole Blum and Professor Chris Husbands, Institute of Education, University of London, United Kingdom
- Assistant Professor, Noah Feinstein, School of Education, University of Wisconsin-Madison, USA
- Dr. Kevin Winter, School of Education, University of Cape Town, South Africa

We would also like to express our gratitude and special thanks to Dean Cho Young Dal and his staff at Seoul National University for their excellent hosting of the conference on ‘Climate Change and Sustainable Development: The Response from Education’, 19 August 2009.

The Danish research team, Copenhagen, November 2009.

1 Professor Jeppe Læssøe, Professor Karsten Schnack, Associate Professor Søren Breiting, Senior Consultant Leif Glud Holm and Research Assistant Simon Rolls.

LINKS TO THE NATIONAL REPORTS
http://edusud.dk and http://dpu.dk/RPEHE

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INTRODUCTION

In December 2002, the United Nations Decade of Education for Sustainable Development (2005–2014) was adopted by the UN General Assembly, and UNESCO was nominated to act as lead agency for the promotion of the Decade. The ambitious goal of the Decade is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. A sustainable future is defined as a development “that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development Report, 1987). Sustainable development is viewed as a complex issue, encompassing economic, environmental and social dimensions. In other words, sustainable development is essential to satisfy human needs and improve the quality of human life. However, although we are now at the halfway-point of the Decade for ESD, the actual role and contribution of education has so far mainly been dealt with in vague terms.

Since the start of the Decade of ESD in 2005, the increasing awareness of accelerating climate change and the potential threats to human existence has led to growing concern for environmental issues. In December this year, the COP15 United Nations Climate Change Conference (the 15th annual Conference of the Parties) will take place in Copenhagen, Denmark. Here Ministers, officials, experts and NGOs from 189 countries will discuss and try to reach an agreement on how to tackle the challenge of climate change. The question is whether the role of education will be included in these negotiations, and, if so, which concept of and approach to education this will entail? There are certainly good reasons for providing the delegates and the global mass media with qualified suggestions of the role education might play.

The International Alliance of Leading Education Institutes has therefore decided to pool its unique resources within the field of ESD in a project exploring the response from education to the challenges of climate change and sustainable development from a truly international perspective.

AIM AND RESEARCH QUESTIONS

The aim of the joint research project has been to carry out and present a cross-national analysis and a set of recommendations for future ESD and future research in ESD. The key milestones have been to present the results of this analysis and the resulting recommendations at the August 2009 conference of the international alliance in Seoul, South Korea, and then later at a press conference in conjunction with the climate summit in Copenhagen in December 2009.

The project has been guided by the following four research questions:

- How is the concept of ESD, and the role and challenges of education in relation to sustainable development, interpreted in national strategies for the promotion of ESD?
- What is the state-of-the-art of empirical and conceptual research on ESD in the ten participating countries?
- Is it possible to draw any conclusions on the basis of existing research regarding what works (and what doesn’t)?
- Does education play a part in the national efforts to cope with mitigation and adaptation to climate change? If so, how is it approached and how do these efforts influence ESD and vice versa?

RESEARCH APPROACH

This report presents the results of a comparative analysis of the ten national reports produced by the participating institutions. The national analyses which, as such, form the foundation for this report were not, however, conducted on the basis of a uniform data collection and processing procedure. Instead, it was decided that the design should remain open and sensitive to the fact that the countries involved vary greatly in terms of size, and of educational and research culture and traditions. They represent divergent political structures and have undergone different historical processes concerning the development of ESD. For these reasons, a compromise has been chosen between a common research design, enabling comparison, and a respect for diversity, ensuring that each partner would be able to present a fair representation of the situation in their country. Therefore, at the beginning of the project, a set of guidelines was compiled containing a long series of sub-questions concerning the study’s main themes. At the same time, it was also emphasised these were merely guidelines and that

ABBREVIATIONS

ESD: Education for Sustainable Development
CCCE: Climate Change Education
EE: Environmental Education
UN: United Nations
UNESCO: United Nations Educational, Scientific and Cultural Organisations
NGO: Non Governmental Organisations

The national reports are available both compiled and as separate documents. When cited, they are referenced using the format (National reports: country abbreviation p.xx). The country abbreviations used are as follows:

AUS: Australia
BRA: Brazil
CAN: Canada
CHN: People’s Republic of China
DEN: Denmark
KOR: South Korea
RSA: South Africa
SIN: Singapore
UK: United Kingdom
USA: United States of America
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USA: United States of America

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each individual national report should contain a historical analysis of the local development of ESD which considered the sub-questions in a meaningful way within the particular national, historical context. This has resulted in ten cohesive analyses of ESD and CCE in the countries the participating institutions represent, rather than a string of more specific, isolated responses to individual questions. On the basis of these national reports, the subsequent cross-national analysis has identified both general tendencies, significant variations, and particular phenomena considered to have a wider relevance.

Education for sustainable development (ESD) constitutes the area for this study, but, at the same time, it is a relatively new and complex concept. Neither education nor sustainable development is unambiguous and straightforward concepts, so ESD is very much open to interpretation. Settling on one fixed definition of education and sustainable development would have meant excluding other interpretations, perspectives and data right from the start. In order to ensure a focused study whilst simultaneously maintaining openness and sensitivity toward the use of the concept of ESD in different contexts, we used UNESCO’s official documents on the UN Decade for ESD in compiling the guidelines for the national reports, but also made a point of allowing these analyses the opportunity to consider the various ways ESD is perceived and practised. It has proven to be the case that ESD, due to the UN’s use of the term, can today be regarded as an all-embracing umbrella term, but, at the same time, that there exists criticism of the term and alternatives to it in the various national contexts. The open approach taken here enables us to observe and describe this ambiguity.

The strength of this study lies in its scope. With the participation of researchers from ten nations, the report provides a broad overview of the current situations and developments regarding ESD and CCE in countries of varying size and representing each and every continent. Breadth often stands in opposition to depth, and indeed, such a relatively wide-reaching short-term project at this cannot fully take into account the amount of detail and depth the field contains. For researchers and practitioners involved in ESD and related areas, this report may feel incomplete. A phrase from the US national report can, in this sense, be said to apply to the study as a whole: “Thoroughness was too great a goal for the scope of the work; usefulness, hopefully, was not.”

Despite the breadth of the study, attention must be drawn to certain limitations regarding the global perspective. As such, the ten nations may represent different continents, but they are not among the world’s poorest nations. This is important to note, as the challenges of climate change and ESD are clearly different in less economically developed countries.

The role of education in relation to the challenges of sustainable development and climate change respectively.

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The eight policy recommendations are:

1. Interpreting ESD
2. Climate Change and Education
3. Structural conditions regarding ESD
4. Barriers related to development and implementation of ESD/CCE
5. Research

Each of these chapters commences with a description of the key issues or problems faced. Findings are then presented across the national reports. The chapters conclude with reflections on these findings.

Please note: This report has been compiled as the knowledge basis for the IALEI conference in Seoul, August 2009, and the development of a set of joint recommendations for the policy level. For this reason it does not include a conclusion. At our homepages: http://edusud.dk and http://dpu.dk/RPEHE, you can find the following documents, based on the cross-national analysis in this report and IALEI presentations and discussions in Seoul:

> The eight policy recommendations
> Promising practices
Climate Change Education (CCE) and Education for Sustainable Development (ESD): What are we talking about?

The role of research and researchers: The need for knowledge related to education

Brief description of International Alliance of Leading Education Institutes

Brief description of the joint research project: Climate change and sustainable development: the response from education

Climate Change and Sustainable Development: The Response from Education, National Reports.

The role of the ten nations in the development of the framework for reporting

The STRUCTURE OF THE REPORT:
The report is organised around a presentation of the five themes identified in the cross-national analysis:

> Theme 1: Interpreting ESD
> Theme 2: Climate Change and Education
> Theme 3: Structural conditions regarding ESD
> Theme 4: Barriers related to development and implementation of ESD/CCE
> Theme 5: ESD and pedagogical traditions and development tendencies: ESD and school development; ESD and what happens in the classroom; ESD and teaching methodologies.

The eight policy recommendations

Why climate change and sustainable development challenge the way we understand and practice education

Climate change and sustainable development: the response from education

Climate Change and Sustainable Development: The Response from Education, National Reports.

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Why climate change and sustainable development challenge the way we understand and practice education

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The considerable development and the role and function it should have within society, and partly to the intrinsic tension contained within the concept of sustainable development (SD), a phrase that has been controversial since it entered the public conscience with the publication in 1987 of the so-called Brundtland report Our Common Future. The considerable impact of ‘SD’ is linked to this intrinsic tension – the concept, with its juxtaposition of the words sustainable and development, can help to bridge the gap between otherwise conflicting interests. Environmentalists tend to promote conservation, protection and restoration while advocates for development tend to value productivity, progress and change. Both positions are associated with a number of problems, however. By agreeing on a concept of sustainable development it would seem possible, at least on the surface, to establish some common ground from which to tackle the global challenges we face.

When the individually complex concepts of education and sustainable development are combined, the result is a hyper-complex concept which is very open to interpretation. This provides ample opportunity for implementation in accordance with national or regional cultures and traditions which can include variability and diversity of SD projects, as encouraged by UNESCO and similar organizations. On the other hand, the openness of the concept can result in a broadness such as a blanket term for more or less anything, including the continuation of the status quo, or as a convenient label for new initiatives actually implemented for other reasons.

SD is practically as well as conceptually complex, involving a high degree of interdisciplinarity. If sustainable development is fundamentally a matter of ensuring a good existence for everybody both in the present and in the future, then it involves not just an array of different dimensions and disciplines including ecology, economy, culture, politics and so forth, but also extensively the interaction between them. The Vermont Guide to Education for Sustainability, produced by one of the NGOs that are highly influential in the USA, describes the multidimensionality of ESD in this way: “The goals of sustainability are often referred to as environmental integrity, economic prosperity, and social equity. Education for Sustainability, or EFS, tries to bring these three goals of sustainability closer to reality. It promotes understanding of the interconnectedness of environment, economy, and society” (National reports: USA p. 332). This is in itself an enormous challenge for education, a challenge that is magnified in the context of an institution (the school) that is typically organised according to strict principles of disciplinarity.

**FINDINGS**

A certain degree of variability in terminology can be observed across the participating IALEI countries, with examples including ‘Education for sustainability’ (e.g. USA and Australia), ‘Environmental education for sustainability’ (e.g. China), and ‘Learning for a sustainable future’ (e.g. Canada). These variations do not correspond to clear or consistent differences in meaning, however, and are generally not ascribed any great significance in the national reports (e.g. AUS). The designation ‘Education for Sustainable Development’, as used for the UN Decade, seems to be gaining in prevalence to the extent that it is typically organised according to strict principles of disciplinarity.

The report from Singapore states: “while there has been some integration of environmental education...” Other countries, rather than breaking ESD into themes, list a set of constitutive principles. In Australia, for example, the new ‘National Action Plan for Education for Sustainability’ (April 2009) outlines the following principles based on a holistic approach to ESD: “Transformation and change, Education for all and lifelong learning, Systems thinking, Envisioning a better future, Critical thinking, Participation, and Partnership for change” (National reports: AUS p. 13). It is clear from the Australian report that “a goal of ESD is to develop ‘informed and involved citizens’ who can actively participate in decision-making and actions for sustainable development” (National reports: AUS p. 14).

This last passage also indicates an understanding of education’s role within society regarding SD which links ESD with citizenship education: “At the core of the role of pupils as active participants in the democratic decision-making process, rather than just portraying them as recipients of pre-determined ‘correct’ opinions. In Singapore, a more directive approach is adopted when it is stated that ‘They [the pupils] should be nurtured to act beneficially towards the environment’, and ESD is regarded as a ‘proactive movement’ (National reports: SIN p. 256). In Korea, also, ESD is employed to ensure that society develops in a particular direction: “ESD is employed because the ‘people’ is the most important factor for driving sustainable development (Lee et al. 2005)” (National reports: KOR p. 201). Ultimately, it is difficult to infer from such broad statements whether ESD in a particular is seen as instrumental or open-ended, whether it is a means to pre-determined ends or a way of enhancing broader reflection and decision-making about sustainability.

This theme is closely related to the question of whether ESD is viewed from an empowerment perspective or a behaviour modification perspective. From an empowerment perspective, the goal is to help learners to develop as an independent thinker and to consider which SD-related issues are of importance and to which they can contribute. From a behaviour modification perspective, the goal is to alter a person’s habits in line with more or less prescribed ideals, which are not themselves open to discussion. The criteria for success, and thereby the indicators and evaluation parameters, are clearly very different depending on the perspective.

This difference can also be articulated as a question of whether ESD is concerned with ‘narrow behaviour’ or ‘socio-political actors’, a question, which has been a theme in England. Here, there has likewise been a need to distinguish between a content-determined interpretation of ESD and an interpretation more focused on processes and on the development of ‘leadership’ skills (UK). The latter interpretation can be illustrated by the Australian principles outlined above, whilst the Korean approach may illustrate a more content-determined interpretation.
THEME 1: INTERPRETATIONS OF ESD

THE ISSUE
Education for Sustainable Development (ESD) is an open, vibrant, and contested concept and is likely to remain so. This is due partly to the existent innumerable interpretations of education, and of the role and function it should have within, and partly to the intrinsic tension contained within the concept of sustainable development (SD): a phrase that has been controversial since it entered the public conscience with the publication in 1987 of the so-called Brundtland Report One Common Future. The considerable impact of ‘SD’ is linked to this intrinsic tension – the concept, with its juxtaposition of the words ‘sustainable’ and ‘development’, can help to bridge the gap between otherwise conflicting interests. Environmentalists tend to promote conservation, protection and restoration while advocates for development tend to value productivity, progress and change. Both positions are associated with a number of problems, however. By agreeing on a concept of sustainable development it would seem possible, at least on the surface, to establish some common ground from which to tackle the global challenges we face.

When the individually complex concepts of education and sustainable development are combined, the result is a hyper-complex concept which is very open to interpretation. This provides ample opportunity for implementation in accordance with national or regional cultures and traditions which can include an emphasis on diversity and the eradication of ESD projects, as encouraged by UNESCO and similar organizations. On the other hand, the openness of the concept can result in it being used as a blanket term for more or less anything, including the continuation of the status quo, or as a convenient label for new initiatives actually implemented for other reasons.

ESD is practically as well as conceptually complex, involving a high degree of interdisciplinarity. If sustainable development is fundamentally a matter of ensuring a good existence for everybody both in the present and in the future, then it involves not just an array of different dimensions and disciplines including ecology, economy, culture, politics and so forth, but also extensively the interaction between them. The Vermont Guide to Education for Sustainability, produced by one of the NGOs that are highly influential in the USA, describes the multidimensionality of ESD in this way: “The goals of sustainability are often referred to as environmental integrity, economic prosperity, and social equity. Education for Sustainability, or EFS, tries to bring these three goals of sustainability closer to reality. It promotes understanding the interrelationships of environment, economy, and society” (National reports: USA p. 332). This is in itself an enormous challenge for education, a challenge that is magnified in the context of an institution (the school) that is typically organised according to strict principles of disciplinarity.

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In most countries ‘Environmental Education’ (EE) is a more established field. Educational initiatives and, in particular, research on and around EE is often not found under the name of EE. There are considerable differences in terms of how important it is considered to be in different countries and disciplines. Across the IALEI countries, extensive understandings of ESD such as those found in UNESCO documents were more prevalent in general policy statements, while curricula, teaching materials and classroom practices are more likely to embody a narrower perspective consistent with a traditional EE approach. The report from Singapore states: “while there has been some integration of environmental educ.”

Other countries, rather than breaking ESD into thematic, list a set of constitutive principles. In Australia, for example, the new ‘National Action Plan for Education for Sustainability’ (April 2005) outlines the following principles based on a holistic approach to ESD: “Transformation and change, Education for all and lifelong learning, Systems thinking, Envisioning a better future, Critical thinking, Participation, and Partnership for change” (National reports: AUS p. 13). It is clear from the Australian report that “a goal of ESD is to develop informed and involved citizens who can actively participate in decision-making and actions for sustainable development” (National reports: AUS p. 14).

This last passage also indicates an understanding of education’s role within society regarding SD which links ESD with citizenship education: “the role of pupils as active participants in the (democratic) decision-making process, rather than then portraying them as recipients of pre-determined ‘correct’ opinions. In Singapore, a more directive approach is adopted when it is stated that “they [the pupils] should be nurtured to act beneficially towards the environment”, and ESD is regarded as a ‘proactive movement’ (National reports: SIN p. 256). In Korea, also, ESD is employed to ensure that society develops in a particular direction: “it should be a condition of development because the ‘people’ is the most important factor for driving sustainable development (Lee et al. 2005)” (National reports: KOR p. 201). Ultimately, it is difficult to infer from such broad and vague definitions of ESD in a particular is seen as instrumental or open-ended, whether it is a means to pre-determined ends or a way of enhancing broader reflection and decision-making about sustainability.

This theme is closely related to the question of whether ESD is viewed from an empirically determined perspective or a behaviour modification perspective. From an empowerment perspective, the goal is to help pupils develop as an independent thinker, who considers and engages with society’s important challenges, both alone and especially in dialogue with others. From a behaviour modification perspective, the goal is to alter a pupil’s habits in line with more or less prescribed ideals, which are not always open for discussion. The criteria for success, and thereby the initiative and evaluation parameters, may differ considerably depending on the perspective.

This difference can also be articulated as a question of whether ESD is concerned with ‘narrow behaviour’ or ‘socio-political action’, a question, which has been a theme in England. Here, there has likewise been a distinction between a content-determined interpretation of ESD and an interpretation more focused on processes and on the development of social issues. The list demonstrates that ESD is viewed not only as a continuation of broadening of EE, but that other related fields such as peace education are also ‘regarded as kinds of subject or sub-areas constituting ESD’.
The national reports for the most part indicate that the overriding approach in the investigated policy documents is an empowerment approach, but the findings are by no means clear-cut. In many cases, both the empowerment and behaviour-modification perspectives are embedded within a national approach to ESD even though the two are not logically compatible. This may be regarded as a pragmatic compromise in the negotiations of different input.

As it appears from the country reports from e.g. China and South Korea, the development of ESD is not a process restricted by national borders. It is to a large extent inspired by input from, and cooperation with, international agents (CHN, KOR). At the same time ESD-researchers in some of the countries have, more or less directly, influenced the descriptions of ESD at the policy level. The role of educational researchers has, as will be explained further in theme 3, partly been to interpret and discuss the concept of ESD and, as part of this, not least to reflect critically on the narrow behaviour-modification approach (UK, USA, CAN, DFN, CHN). Thus, with close relations to the policy level, it seems reasonable that educational researchers to some extend have inspired the officers at the policy level to include empowerment-oriented formulations in the overall purpose of policy to promote ESD. The crucial question is, however, whether this comprehensive approach to ESD remains rhetoric proclamations or whether it is converted into regular policy initiatives and concrete practice? The last mentioned possibility is, for several reasons, doubtful.

Firstly, ESD combines, on the one hand, the educational field and its discourses and, on the other hand, sustainable development and the discourses that dominate this field. The competence oriented approach is related to the first mentioned, while the wishes to promote behaviour modification of the population are related to the technical-instrumental logic that dominates environmental management. The tensions between these positions are evident from several of the country reports. The report from USA contains an illustrative example. This example shows how a technological oriented draft for ESD with a narrow informative strategy, was transformed through negotiations with other types of agents, including the educational community, with the result that it ended up as a much broader competence-oriented approach. In some of the participating countries the tensions between the different approaches are accentuated by the efforts to promote sustainable development by means of technological and economic innovation (CAN, SIN, KOR).

Secondly, the competence oriented approach is also contested by other aims and conceptions in the field of education. To this belongs partly the emphasis on qualifications requested by the business community and, thus, of great importance for the economic development (DEN, SIN), partly the recent trends to promote the application of standardised assessments within formal education (UK).

Thirdly, and not least, the competence oriented approach requires innovations in schools that can be difficult to implement. This will be further detailed in theme 3 and 4.

REFLECTIONS

As detailed in the Canadian report, there is an ongoing conceptual critique of ESD in the academic literature. Scholars including Bob Jickling, Lucie Sauvé and Connie Russell have argued that the ‘official’ UNESCO concept of ESD contains a number of weaknesses that, combined, make ESD a step backward from EE. Inspired by David Bell, it can be considered a decisive question whether ESD is a cure or placebo, that is, a means of helping mankind attain a more sustainable future or a distracter from the main challenge facing mankind (Bell, 2007).

For several of the critics, ‘sustainable development’ is ‘nothing more than a vague slogan susceptible to manipulation and deception’ (National reports: CAN p. 105). They posit that there is a particular ideology intrinsic to ESD that can all too easily lead to indoctrination with certain values and ideas. More specifically, it is claimed that ESD is buttressed by: a resource view of the environment, an economic view of development, and an instrumental view of education. On a deeper level, there is criticism of the anthropocentric orientation within ESD and the attempt to subvert EE to this worldview, something which is inconsistent with their view that EE is, or at least should be, based upon an ecocentric worldview.

On the basis of this international study, it does indeed appear that anthropocentrism is a consistent characteristic of the various national approaches to ESD. This should come as no surprise, given that ESD emphasizes the needs of current and future human generations. Yet there is no doubt that ‘need, like ‘sustainability’, is an open and disputed concept with an inherent normativity. Our findings do not provide substantiation for claims that there will (always) be a reduction in the ethical and political reflections involved in determining what counts as genuine and worthy needs. Conversely, it is not always apparent from the material that a more indoctrinating pedagogy has been clearly rejected. Perhaps this is sometimes implied as a matter of course, but it likely deserves a more explicit relativization.

Another source of a potential reduction in both the breadth and depth of the concept of ESD has to do with the fact that it is various environmental or humanitarian NGOs that are the primary source of pressure on the educational sector in relation to an intensification of ESD efforts. As such interest groups are by nature somewhat, partisan and primarily concerned with a cause other than general education, the pressure they bring to bear typically involves harnessing education in the service of specific objectives. While some of these organisations in fact have objectives that are consistent with and contribute to the goals of sustainable development, the tendency within the policy environment to reduce such an understanding to one which is in part easier to govern and measure within a top-down model, in part more limited in terms of disciplines, perhaps in line with a pre-existing policy objective of raising the profile of particular subjects.

As described in the section on findings, these reductions are not dominant in the overall purpose descriptions of ESD. In general, they contain a broad collection of ideal formulations, as often seen in such policy documents. However, the challenge during the coming years will be to transform the ideals into practice; that is to create the opportunities for implementation of the more comprehensive competence oriented approach to ESD.
The national reports for the most part indicate that the overriding approach in the investigated policy documents is an empowerment approach, but the findings are by no means clear-cut. In many cases, both the empowerment and behaviour-modification perspectives are embedded within a national approach to ESD even though the two are not logically compatible. This may be regarded as a pragmatic compromise in the negotiations of different input.

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As described in the section on findings, these redactions are not dominant in the overall purpose descriptions of ESD. In general, they contain a broad collection of ideal formulations, as often seen in such policy documents. However, the challenge during the coming years will be to transform the ideals into practice, that is to create the opportunities for implementation of the more comprehensive competence oriented approach to ESD.
THEME 2: CLIMATE CHANGE AND EDUCATION

THE ISSUE
Over the course of the last few years, there is probably no other issue that has received greater global attention than climate change. This intense interest has led to questions about the role that schools play, or could play, in global efforts to mitigate or adapt to climate change.

From a pedagogical viewpoint, climate change is uniquely challenging. The starting point is a set of near-future scenarios that are all threatening and problem-filled. Climate change also requires risk assessment on the basis of uncertain knowledge and the acknowledgment that solutions will require political and ethical choices as well as technical innovations. In these realms, there is far less agreement than there is regarding the fact that there are problems which need solving. As highlighted in, for example, the Brazilian report, this complex and depressing picture can provoke two conflicting responses: a passive and paralyzing fatalism or an oversimplification of the many important factors involved (BRA).

The indeterminate and inherently political nature of climate change challenges the traditional “modern” understanding of the role of education, rooted in positivist epistemology, as a source of objective, reliable knowledge of the world, imparted through segregated academic disciplines. Perhaps more strongly than any other issue, climate change tests the capacity of education to organize around problems characterized by complex social dynamics, uncertain knowledge, and risks.

As was apparent in theme 1, such problems are not new and, to some extent, characterize all of education. In these realms, there is far less agreement than there is regarding the fact that there are problems which need solving. As highlighted in, for example, the Brazilian report, this complex and depressing picture can provoke two competing responses: a passive and paralyzing fatalism or an oversimplification of the many important factors involved (BRA).

FINDINGS
It would be untrue to say that climate change and the individual action and societal actions needed to address climate change are new topics for education. Both can be found in environmental teaching materials from recent decades. Indeed, the general tendency found in the national reports is that CCE has not emerged as an independent field, but rather as an integral part of EE and ESD. In fact, it is a recurring theme across IALEI countries that CCE has only gradually begun to develop its own identity during the last three years, and is therefore still very much in its infancy. In some countries, this development is driven by government initiatives concerning climate change. The Chinese government, for example, has adopted climate change action plans which include specific education initiatives (CHN). Knowledge about CC will be included in basic education, higher education and adult education with focus on awareness and participation in relevant activities. Similarly, in the Canadian province of Newfound- land and Labrador, there has been a Climate Change Action Plan since 2005 which emphasizes CCE. In this province, the route from plans may be attributed to the clearly visible local effects of climate change (CAN). The Danish government’s 2009 ESD strategy has also launched a number of specific initiatives concerning CCE (DEN). New CCE initiatives under the rubric of EE and ESD can likewise be found in other countries. In Australia, where ESD is well-established and includes environmental education (DEE), the “Solar School Initiative” has been launched under the auspices of EE but with specific reference to climate change. This initiative do not place climate change within the context of ESD, seeking instead to promote a general science education (DEN).

These scenarios seem still open for negotiations. Different stakeholders will deliberately try to influence the result. The Danish country report notes that “education is conspicuous by its absence” in a recently published national climate policy document (National reports: DEN p. 176). This seems to be the case for other countries as well (e.g., Singapore) and one reason could be that the national climate policy documents target the populace whereas education is within the purview of another ministry and is left to the Ministry of Education to translate the national climate policy document into its own curriculum development for schools.

> One scenario is that CCE will develop independently of ESD, becoming a major theme within science education. This tendency is found in the USA, where CCE has so far been interpreted as “education about the scientific understanding of global climate change” (National reports: USA p. 327). A similar picture can be seen in China, where CCE is comprised of science popularization activities aimed at raising awareness and motivating students to follow behavioural advice (CHN). This seems to be a restricted approach compared to the general ESD policy in China, which is guided by four basic principles: value education, a holistic and interdisciplinary approach, increase of diversity and competence and creative inquiry.

> Another possibility is that CCE will develop as an integral element of ESD, emerging as a truly interdisciplinary pursuit. This tendency is mentioned in the reports from Australia, UK, South Korea and Singapore. This scenario is open for different variations due to the fact that ESD is not an easily categorized concept. For example, it makes a difference if CC is included in ESD as part of a Green Growth strategy (cf. SIN, KOR and CAN) rather than as an issue which includes global ethics, transformation of lifestyles, social equity, limits to growth and other key topics of sustainable development.

> A third scenario is a hybrid of the first two, in which CCE is treated as an independent element under the umbrella of ESD, with ESD serving as collective term for a variety of independent focus areas thematically related to SD. This scenario is embodied in the Danish national ESD strategy, which contains a number of CCE initiatives that constitute an “educational transition” toward a greater emphasis of general education (DEN). The authors of the UK report emphasise the possibility that CCE represents a step backwards.

> Although it is also too soon to know how the idea of CCE might develop in future, it is worth noting that there is concern amongst many educators in the UK that it presents a worrying narrowing of ESD aims and agendas. Will anxiety about and increasing attention to particular climate change issues – especially dangerous, dramatic environmental disasters (floods, cyclones) – underpin broader educational attempts to promote sustainable development and sound environmental management? And will the frustration and impeding environmental disaster lead to education programmes which are focused on behaviour change about single issues (carbon emissions, recycling, transport) to the detriment of holistic goals (for example to encourage critical thinking and democratic participation)? Much of the discussion about ESD in the UK over the last decade has focused on how best to bring diverse and multiple perspectives into ESD programmes, so limiting the discussion to only climate change issues seems to many – to be a step in the wrong direction. (National reports: UK p. 301ff).

As is especially apparent from the Danish report, CCE is an arena for a process with various stakeholders – NGOs, teacher networks, consultants etc – who interpret CCE and influence whether it will be integrated in a broader ESD framework or whether it will imply a re-interpretation of ESD. As the same stakeholders are present in the other countries as well, there is good reason to believe that the process of integration is uniquely challenging.
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From a pedagogical viewpoint, climate change is uniquely challenging. The starting point is a set of near-future scenarios that are all threatening and problem-filled. Climate change also requires risk assessment on the basis of uncertain knowledge and the acknowledgment that solutions will require political and ethical choices as well as technical innovations. In these realms, there is far less agreement than there is regarding the fact that there are problems which need solving. As highlighted in, for example, the Brazilian report, this complex and depressing picture can provoke two troubling responses: a passive and paralyzing fatalism or an oversimplification of the many important factors involved (BRA).

The indeterminate and inherently political nature of climate change challenges the traditional ‘moderated understanding of the role of education, rooted in positivist epistemology, as a source of objective, reliable knowledge of the world, imparted through science education (CC e) as the general term for the phenomenon in this paper) as an independent concept and focus area, whether it is labelled as ‘climate education’ or ‘climate change education’ (CCE). The national reports offer three different possibilities:

- One scenario is that CCE will develop independently of ESD, becoming a major theme within science education. This tendency is found in the USA, where CCE has so far been interpreted as ‘education about the scientific understanding of global climate change’ (National reports: USA p. 327). A similar picture can be seen in China, where CCE is comprised of science popularization activities aimed at raising awareness and motivating students to follow behavioural advice (CHN). This seems to be a restricted approach compared to the general ESD policy in China, which is guided by four basic principles: value education, a holistic and interdisciplinary approach, increase of diversity and competence and creative thinking.

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- A third scenario is a hybrid of the first two, in which CCE is treated as an independent element under the umbrella of ESD, with ESD serving as collective term for a variety of independent focus areas thematically related to SD. This scenario is embodied in the Danish national ESD strategy, which contains a number of CCE initiatives that concern about single issues (carbon emissions, recycling, transport) to the detriment of holistic ESD goals (for example to encourage critical thinking and democratic participation)? Much of the discussion about ESD in the UK over the last decade has focused on how best to bring diverse and multiple perspectives into ESD programmes, so limiting the discussion to only climate change issues seems – to many – to be a step in the wrong direction. (National reports: UK p. 301f).

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Under theme 1, we described how ESD has developed against the backdrop of an ongoing tension between two opposing perspectives. On one side, there is the narrow and instrumental view of ESD as the communication of scientific knowledge with the goal of modifying student behaviour; on the other, a broader understanding of ESD as the development of general competences that are more important in action and decision-making. The current focus on climate change seems to be intensifying this conflict. The term ESD has been used around the globe as a tool for rethink education and developing a broad spectrum of relevant competences; CCE could either accelerate this process or bring it to a halt. The authors of the UK report emphasise the possibility that CCE represents a step backwards:

- Although it is also too soon to know how the idea of CCE might develop in future, it is worth noting that there is concern amongst many educators in the UK that it presents a worrying narrowing of ESD aims and agendas. Will anxiety about and increasing attention to particular climate change issues – especially desperate, dramatic environmental disasters (floods, cyclones) – undercut broader educational attempts to promote sustainable development and sound environmental management? And will the fragmenting and impeding environmental disaster lead to education programmes which are focused on behaviour change about single issues (carbon emissions, recycling, transport) to the detriment of holistic ESD goals (for example to encourage critical thinking and democratic participation)? Much of the discussion about ESD in the UK over the last decade has focused on how best to bring diverse and multiple perspectives into ESD programmes, so limiting the discussion to only climate change issues seems – to many – to be a step in the wrong direction. (National reports: UK p. 301f).

These scenarios seem still open for negotiations. Different stakeholders will definitely try to influence the result. The Danish country report notes that stakeholders around the country are making big efforts to maintain the current focus on climate change within the context of ESD, seeking instead to promote a general science education (DEN).

As stated in the introduction, we use the term Climate Change Education (CCE) as the general term for the phenomenon in this study. Since the field of climate change education is still in its infancy, in some countries, this development is driven by government initiatives concerning climate change. The Chinese government, for example, has adopted climate change action plans which include specific education initiatives (CHN). Knowledge about CC will be included in basic education, higher education and adult education with focus on awareness and participation in relevant activities. Similarly, in the Canadian province of Newfoundland and Labrador, there has been a Climate Change Action Plan since 2005 which emphasises CCE. In this province, the route from plans may be attributed to the clearly visible local effects of climate change (CAN). The Danish government’s 2009 ESD strategy has also launched a number of specific initiatives concerning CCE (DEN). New CCE initiatives under the rubric of EE and ESD can likewise be found in other countries. In Australia, where ESD is well-established, the new and ambitious National Solar School Initiative has been launched under the auspices of ESD but with specific reference to climate change (AUS). This initiative aims to do not place climate change within the context of ESD, seeking instead to promote a general science education (DEN).

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Although researchers warn that the emergence of CCE may represent a step in the wrong direction, this does not mean that the issue of climate change necessarily entails a narrowing of focus to the detriment of other issues currently included within ESD. Indeed, discussions about climate change can give rise to consideration of far-ranging issues such as water shortage, agriculture, energy supplies, class tension, conflicts of interest regarding the distribution of goods, economic growth, political governance, lifestyles, and ethics. Climate change intensifies problems within all these areas, while climate mitigation and adaptation will certainly affect such intertwined issues. Seen in this light, the contemporary focus on climate change may be useful for ESD, even from the empowerment perspective. For this to happen, however, CCE must be conceptualised as more than simply climate change science, and CCE must be effectively integrated as a central theme within ESD rather than an independent field.

During this transitional moment, research can play a significant role in shaping the relationship between ESD and CCE. First, researchers can help by more thoroughly clarifying and documenting that relationship. Second, research can fulfil an innovative function, challenging the pervasive assumptions about CCE and deliberately working to bring about dialogue and long-term planning. The nascent field of CCE is currently in need of both clarification and dialogue, at least on the evidence of the national reports. The national report from South Africa illustrates the constructive role of research in bridging CCE and ESD. Lotz-Sisitka (2009) describes how climate change requires educators to transcend the local focus of social learning projects by connecting actions in one region to climate consequences in another. Lotz-Sisitka and le Grange (2009) also point out that the empowerment view of CCE poses a far greater challenge to the field of education, as it is more difficult to foster a proactive response to the climate change than it is to encourage a passive, reactive response. There is a stark contrast between the enormity of this task and the limited scale of ESD projects around the world. The urgency and global nature of climate change reveal a pressing need to develop and strengthen ESD, which means that researchers, as well as practitioners and other ESD stakeholders are faced with an important task in the coming years.


### Theme 3: Structural Conditions Regarding ESD

#### The Issue
When ESD is introduced into an existing educational system and school, a number of structural tensions arise. ESD does not have a pre-determined structure; instead it can be implemented in a variety of forms, thereby creating the possibility for adaptation to the established systems. Meanwhile, as these are usually influenced by other logics, the encounter generally tends to result in friction. While, in principle, it is merely a case of making some decisions, it is not always clear who should be making them. Furthermore, there are so many different interests and stakeholders involved that, as the national reports make clear, a direct route between the different levels, between theory, policy, external pressure and praxis, can seldom be detected.

The issue comes largely to revolve around the extent to which ESD is perceived and treated as something new to be added to the existing curriculum, thereby becoming an additional burden. Across national borders, schools are typically divided along fairly rigid subject or disciplinary lines and each discipline is often overcrowded with subject matter which pupils are required, or at least expected, to learn. Teachers are often trained to teach particular age groups and/ or particular subjects. All in all, it can be difficult to ensure that ESD receives space in the school day, much less a cohesive treatment and logical progression across the age groups.

Of course, this is not only a structural issue, but also an ideological and pedagogical one. As is clear from the national reports, however, the structural issues are unavoidable. They include:

- the position and status of ESD within the school system;
- the disciplinary, multidisciplinary, and interdisciplinary organisation of ESD programs;
- the application of whole-school approaches to ESD.

#### Findings
At the structural level, there are several ways to implement ESD within the school and the education system. Here, we will start with the Canadian report’s presentation highlighting three of the possible different approaches to incorporating ESD within formal education: ESD as a part of science education; ESD as infused across the curriculum; and ESD as a fundamental educational principle (National reports: CAN p. 107).

Both the Canadian federal government and provinces such as Ontario have treated ESD as ‘a concept that can be fit into traditional school curricula as part of the discipline of science especially environmental education’ (ibid.). Although this model has been criticised, it would still seem to be the case that ‘science remains at the forefront of efforts integrating ESD into formal education’ (ibid.). In other countries, one also finds the tendency to delegate the responsibility for ESD to a single subject or subject area. In these cases, it is always science which is assigned the task. In Denmark, ESD has even been introduced with the explicit goal of strengthening science education.

The problem with this approach is that the field of school science already tends to be overcrowded and that ESD therefore is all too easily reduced to science education or an ecologically oriented version of EE. Both the Canadian federal government and the provinces have treated ESD as ‘a concept that can be fit into traditional school curricula as part of the discipline of science especially environmental education’ (ibid.). Although this model has been criticised, it would still seem to be the case that ‘science remains at the forefront of efforts integrating ESD into formal education’ (ibid.). In other countries, one also finds the tendency to delegate the responsibility for ESD to a single subject or subject area. In these cases, it is always science which is assigned the task. In Denmark, ESD has even been introduced with the explicit goal of strengthening science education.

The second approach presented in the Canadian report was ESD as infused across the curriculum. In this case, the example is provided by the province of Manitoba. Here, a cross-curricular initiative concerning ESD was introduced in 2000 by dividing ESD into a number of principles that each fit the subjects in the traditional curriculum. In this way,
ing negotiation’ between them will have a decisive influence on CCE and ESD over the next few years, thereby in determining the role that education will play with respect to both climate change and sustainable development more broadly.

Although researchers warn that the emergence of CCE may represent a step in the wrong direction, this does not mean that the issue of climate change necessarily entails a narrowing of focus to the detriment of other issues currently included within ESD. Indeed, discussions about climate change can give rise to consideration of far-ranging issues such as water shortage, agriculture, energy supplies, class tension, conflicts of interest regarding the distribution of goods, economic growth, political governance, lifestyles, and ethics. Climate change intensifies problems within all these areas, while climate mitigation and adaptation will certainly affect such intertwined issues. Seen in this light, the contemporary focus on climate change may be useful for ESD, even from the empowerment perspective. For this to happen, however, CCE must be conceptualised as more than simply climate change science, and CCE must be effectively integrated as a central theme within ESD rather than an independent field.

During this transitional moment, research can play a significant role in shaping the relationship between ESD and CCE. First, researchers can help by more thoroughly clarifying and documenting that relationship. Second, research can facilitate an innovative function, challenging the pervasive assumptions about CCE and deliberately working to bring about dialogue and long-term planning. The nascent field of CCE is currently in need of both clarification and dialogue, at least on the evidence of the national reports. The national report from South Africa illustrates the constructive role of research in bridging CCE and ESD. Lotz-Sisitka (2009) describes how climate change requires educators to transcend the local focus of social learning projects by connecting actions in one region to climate consequences in another. Lotz-Sisitka and le Grange (2009) also point out that the empowerment view of CCE poses a far greater challenge to the field of education, as it is more difficult to foster a proactive response to the climate change than it is to encourage a passive, reactive response. There is a stark contrast between the enormity of this task and the limited scale of ESD projects around the world. The urgency and global nature of climate change reveal a pressing need to develop and strengthen ESD which means that researchers, as well as practitioners and other ESD stakeholders are faced with an important task in the coming years.


THEME 3: STRUCTURAL CONDITIONS REGARDING ESD

THE ISSUE
When ESD is introduced into an existing educational system and school, a number of structural tensions arise. ESD does not have a pre-determined structure; instead it can be implemented in a variety of forms, thereby creating the possibility for adaptation to the established systems. Meanwhile, as these are usually influenced by other logics, the encounter generally tends to result in friction. While, in principle, it is merely a case of making some decisions, it is not always clear who should be making them. Furthermore, there are so many different interests and stakeholders involved that, as the national reports make clear, a direct route between the different levels, between theory, policy, external pressure and praxis, can seldom be detected.

The issue comes largely to revolve around the extent to which ESD is perceived and treated as something new to be added to the existing curriculum, thereby becoming an additional burden. Across national borders, schools are typically divided along fairly rigid subject or discipline lines and each discipline is often overcrowded with subject matter which pupils are required, or at least expected, to learn. Teachers are often trained to teach particular age groups and/or particular subjects. All in all, it can be difficult to ensure that ESD receives space in the school day, much less a cohesive treatment and logical progression across the age groups.

Of course, this is not only a structural issue, but also an ideological and pedagogical one. As is clear from the national reports, however, the structural issues are unavoidable. They include:
  - the position and status of ESD within the school system;
  - the disciplinary, multidisciplinary, and interdisciplinary organisation of ESD programs;
  - the application of whole-school approaches to ESD.

FINDINGS
At the structural level, there are several ways to implement ESD within the school and the education system. Here, we will start with the Canadian report’s presentation highlighting three of the possible different approaches to incorporating ESD within formal education: ESD as a part of science education; ESD as infused across the curriculum; and ESD as a fundamental educational principle (‘National reports: CAN p. 107). Both the Canadian federal government and provinces such as Ontario have treated ESD as ‘a concept that can be fit into traditional school curricula as part of the discipline of science especially environmental education’ (ibid.). Although this model has been criticised, it would still seem to be the case that ‘science remains at the forefront of efforts integrating ESD into formal education’ (ibid.). In other countries, one also finds the tendency to delegate the responsibility for ESD to a single subject or subject area. In these cases, it is always science which is assigned the task. In Denmark, ESD has ever been introduced with the explicit goal of strengthening science education.

The problem with this approach is that the field of school science already tends to be overcrowded and that ESD therefore is all too easily reduced to science education or an ecologically oriented version of EE. Both the Canadian federal government and provinces such as Manitoba have treated ESD as a subject area. In these cases, it is always science which has been criticised, it would still seem to be the case that ‘science remains at the forefront of efforts integrating ESD into formal education’ (ibid.).

The second approach presented in the Canadian report was ESD as infused across the curriculum. In this case, the example is provided by the province of Mautoba. Here, a cross-curricular initiative concerning ESD was introduced in 2000 by dividing ESD into a number of principles that each fit the subjects in the traditional curriculum. In this way,
ESD could be infused into every discipline, thereby maintaining a great deal of breadth in the conception of ESD. The authors of the Canadian report note that such an approach involves the essential structure of teaching and curricula to remain the same (National reports: CAN p. 108).

Whether this comprises an advantage or a disadvantage is open to debate. It is undeniably a problem that this approach ‘may reduce the status of ESD to an ‘add-on’, extra work for teachers and students in an already crowded curriculum’ (ibid.). In addition, the fragmentation of ESD can itself be a problem within such an approach. If ESD is perceived as being all about connections and inter-relationships among surprisingly diverse fields, it is a considerable challenge to ensure the various elements in the curriculum combine to form a somewhat coherent whole.

The third approach identified in the Canadian report ‘to bring ESD into formal education in curriculum and ESD, the US report states: ‘The most likely route countries (AUS, DEN, KOR, UK, USA): There is little agreement regarding terminology within this field, but terms including ‘green schools’, ‘sustainable schools’, ‘eco-schools’ etc. all refer to efforts at the school level that typically involve a greater or lesser proportion of the school’s activity.

The Danish national strategy for ESD includes a project to give higher priority to the so-called Green Flag Green School movement, while simultaneously developing it more in the direction of ESD. This movement is embedded in the international Eco-Schools programme under the Foundation for Environmental Education (FEE), which currently involves 43 nations. The green flag is an award given to the individual school for implementing a more or less comprehensive teaching programme regarding the environment in the surrounding area. Somewhat characteristically, increasing the number of green flag schools by 50% by 2014 is an indicator included in the Danish strategy, but there is also a focus on improving quality within the project (DEN). One of the major challenges here will undoubtedly be offsetting the physical, objective criteria for success (e.g. a reduction in energy and water consumption, a decrease in pollution etc.) with criteria more concerned with pupils’ learning outcomes.

This issue can also be found in the US Green Schools programme, which originally ‘was exclusively focused on the physical school building, its properties and their relationship to student health and performance’ (National reports: USA p. 349). The strategy is generally somewhat broader and oriented more towards pedagogical approaches that reflect various forms of sustainability. Green Schools in the United States are often small- or medium-sized charter schools that lead to their own, usually private or charter schools with their own ability. ‘Green Schools in the United States are...’

This issue can also be found in the US Green Schools programme, which originally ‘was exclusively focused on the physical school building' (AUS p. 11). After a pilot AUS initiative had shown that there were ‘educational, environmental, social and professional benefits’, guiding principles that could be applied nationally were identified, and by 2004 the national AUS initiative had been launched. The principles, the goals and the achievements of the initiative include both environmental and pedagogical points without separating them or problematising the relationship between them. This ‘holistic and systemic approach encompasses school curriculum and pedagogy and school operations, governance, design, management and grounds. Connections with and influencing the community is another key aspect of AUS’ (National reports: AUS p. 4). Such a pervasive programme can be difficult to analyse and difficult to emulate in other contexts. In any case, it requires widespread support to become mainstream – support that has received and continues to receive in the new National Action Plan in Australia (AUS).

In many whole-school ESD projects, particular value is attached to the ‘whole-school approach’ to the local community. ‘Connections with and influencing the community is another key aspect of AUS’ (National reports: AUS p. 4). The whole-school approach can also constitute an integral part of official educational policy regarding ESD. This is the case in Australia where the Australian Sustainable Schools Initiative (ASSI) is a whole-school approach that provides a flagship initiative for ESD in Australian schools (AUS p. 11). After a pilot ASSI scheme had shown that there were ‘educational, environmental, social and professional benefits’, guiding principles that could be applied nationally were identified, and by 2004 the national ASSI initiative had been launched. The principles, the goals and the achievements of the initiative include both environmental and pedagogical points without separating them or problematising the relationship between them. This ‘holistic and systemic approach encompasses school curriculum and pedagogy and school operations, governance, design, management and grounds. Connections with and influencing the community is another key aspect of ASSI’ (National reports: AUS p. 4). Such a pervasive programme can be difficult to analyse and difficult to emulate in other contexts. In any case, it requires widespread support to become mainstream – support that has received and continues to receive in the new National Action Plan in Australia (AUS).
ESD could be infused into every discipline, thereby maintaining a great deal of breadth in the conception of ESD. The authors of the Canadian report note that this approach ‘breathes the essential structure of schooling and curriculum to remain the same’ (National reports: CAN p. 108).

Whether this comprises an advantage or a disadvantage is open to debate. It is undeniable that a problem this approach ‘may reduce the status of ESD to an ‘add-on’, extra work for teachers and students in an already crowded curriculum’ (ibid.). In addition, the fragmentation of ESD can itself be a problem within such an approach. If ESD is perceived as being all about connections and inter-relationships among surprisingly diverse fields, it is a considerable challenge to ensure the various elements in the curriculum, combine to form a somewhat coherent whole.

The third approach identified in the Canadian report ‘to bringing ESD into formal education is to re-orient school curricula to make ESD a fundamental educational goal. This is the approach taken by Nunavut where ESD defined as a basic principle of the true way of life, has been used as a foundation for re-orienting education. In this approach ESD is more cross-curriculum add-on. As a foundational principle, it is built in to every aspect of the curriculum – content, teaching/learning strategies and evaluation’ (ibid.).

Except for small cases in the ‘place-based education literature’ mentioned in the USA report, there are so few instances in the national reports of this approach, which is a pervasive and radical model and it is interesting to note that the territory’s policy is not so much based on the various international documents, but rather tradition, culture, values and traditions which ‘happen to coincide with many of the ideas found in UNESCO’s vision of sustainable development and ESD’ (National reports: CAN p. 96). There is a tendency of an approach which ‘presents an alternative view of governance and development’ (National reports: CAN p. 94) and which is embedded within a culture which is not permeated by modernity in terms of worldview and outlook on life. It is unlikely that the model could be directly imported to industrial, urban schools. But it is, however, thought-provoking and instructive that such alternatives exist.

Because these three approaches have different goals and anticipate different outcomes, it is difficult to directly compare their effectiveness in any meaningful way. One can, however, consider which opportunities they create, and other forms of inter- disciplinary teaching and learning, a theme which plays an important role in virtually all the national reports.

On one hand, some of the more transversal and holistically-oriented outcomes typically associated with ESD require a considerable investment in interdisciplinary learning. This result in experiments with cross-curricular themes, holistic teaching and whole-school approaches (see below). On the other hand, there is still a need to legitimise such approaches, ‘in terms of granting schools ‘eco-credits’ etc. all relate to the traditional subjects. For example, the US report states regarding a pedagogical movement referred to as Environment-Based Education (EBE): ‘This integrative strategy is similar to that favoured by most American proponents of ESD. Although EBE is sometimes criticized within the EE community for its use of EE as a means to disciplinary ends, rather than as an end unto itself, the constraining pressures of standards-based educational reform make it an attractive option for schools seeking to integrate ESD-related content without sacrificing achievement in the traditional disciplines’ (National reports: USA p. 340). This issue raises its head frequently in a number of discussions within the school and in questioning of examinations, as discussed in the report from Singapore: ‘In a very exam-oriented school education system, unless a subject is examinable not only will the emphasis wane, very often teachers’ attitude towards the teaching of this component is sacrificed to the more important subjects that have examinations’ (National reports: SIN p. 266).

Nevertheless, occasional attempts have been made to create frameworks for more multidisciplinary and interdisciplinary teaching/learning in relation to ESD visions. Several of the national reports observe that there is a basis for, at the least, multidisciplinary work with SD values as ESD-related content is explicitly addressed by curriculum standards of many subjects’ (National reports: CHN p. 131, and e.g. DEN), but also the unbalanced subjects is unbalanced (CHN, KOR). As revealed in the Canadian example from Manitoba, it may well be a good procedure to infuse ESD into the existing curriculum, and potentially improve the quality within the project (DEN). One of the major challenges here will undoubtedly be offsetting the physical, objective criteria and success (e.g. a reduction in energy and water consumption, a decrease in pollution etc) with criteria more concerned with pupils’ learning outcomes.

This issue can also be found in the US Green Schools programme, which originally ‘was exclusively focused on the physical school building, its properties and their relationship to student health and performance’ (National reports: USA p. 349). The approach is generally somewhat broader and oriented more towards pedagogical approaches that reflect various forms of sustainability. Green Schools in the United States are orthodox, but it is the charter schools that lead to their own unique values and traditions which happen to coincides with many of the ideas found in UNESCO’s vision of sustainable development and ESD (National reports: CAN p. 96). There is a tendency of an approach which ‘presents an alternative view of governance and development’ (National reports: CAN p. 94) and which is embedded within a culture which is not permeated by modernity in terms of worldview and outlook on life. It is unlikely that the model could be directly imported to industrial, urban schools. But it is, however, thought-provoking and instructive that such alternatives exist.

Because these three approaches have different goals and anticipate different outcomes, it is difficult to directly compare their effectiveness in any meaningful way. One can, however, consider which opportunities they create, and other forms of inter-disciplinary teaching and learning, a theme which plays an important role in virtually all the national reports.

In some countries, there exist, or are planned, examples of more interdisciplinary or cross-curricular possibilities as a supplement to work in the individual, separate subjects (e.g. UK, KOR).

More common, though, are the whole school approaches, which are described in reports from several countries (AUS, DEN, KOR, UK, USA). There is little agreement regarding terminology within this field, but terms including ‘green schools’, ‘sustainable schools’, ‘eco-schools’, etc. all refer to efforts at the school level that typically involve a greater or lesser proportion of the school’s activity.

The Danish national strategy for ESD includes a project to give higher priority to the so-called Green Flag Green School Movement, while simultaneously developing it more in the tradition of ESD.

This movement is embedded in the international Eco-Schools programme under the Foundation for Environmental Education (FEE), which currently involves 43 nations. The green flag is an award given to the individual school for implementing a more or less comprehensive teaching programme regarding environmental management in the surrounding area. Somewhat characteristically, increasing the number of green flag schools by 50% by 2014 is an indicator included in the Danish strategy, but there is also a focus on sponsoring improved quality within the project (DEN).

One of the major challenges here will undoubtedly be offsetting the physical, objective criteria and success (e.g. a reduction in energy and water consumption, a decrease in pollution etc) with criteria more concerned with pupils’ learning outcomes.

The whole-school approach can also constitute an integral part of official educational policy regarding ESD. This is the case in Australia where the Australian Sustainable Schools Initiative (AuSSI) is the whole school approach that the flagship initiative for ESD in Australian schools (AUS p. 11). After a pilot AuSSI scheme had shown that there were ‘educational, environmental, social and professional benefits’, guiding principles that could be applied nationally were identified, and by 2004 the national AuSSI initiative had been launched. The principles, the goals and the achievements of the initiative include both environmental and pedagogical points without separating them or problematizing the relationship between them. This whole-school/holistic and systemic approach encompasses school curriculum and pedagogy and school operations, governance, design, management and grounds. Connections with and influencing the community is another key aspect of AuSSI (National reports: AUS p. 4).

Such a pervasive programme can be difficult to analyse and difficult to evaluate in other contexts. In any case, it requires widespread support to become mainstream – support that it has received and continues to receive in the new National Action Plan in Australia (AUS).

In many whole-school ESD projects, particular value is attached to the school developing a relationship with the local community. ‘Connections with and influencing the community is another key aspect of AuSSI’ (National reports: AUS p. 4). An example is provided from the city of Tongyoung where an elementary school, in collaboration with the local ‘Center for School and Community Activities (Expertise) has developed a significant combination of an ‘entire-school approach’ and close relationship with outside organisations (KOR).

No matter how such cooperation between school and local community is approached structurally, it would seem to provide an invaluable environment for local participation. Summarising the extensive but somewhat fragmentary American research on EE and ESD, the US report states: ‘The most likely route to empowerment – and to a range of other positive
outcomes including enhanced academic achievement and pro-environmental behaviour – appears to be sustained participation in complex environmental projects that cut across disciplinary lines. Furthermore, the intervention strategies that have achieved the most compelling and well-documented success have all focused on "local participation" (National reports: USA p. 346).

ESD does not revolve around structures, but structures influence what takes place within them. If interdisciplinary, issue-oriented and participatory teaching/learning is to be promoted, whole-school approaches and school-community collaborations will continue to be of considerable interest.

It will in any case be critical to identify structures which both enable and make it attractive to work with ESD in a way which counteracts the reactive tendency in which, as Singapore report notes, the populace tends to be reticent and takes a back seat. "The government knows best" is an apt description of Singaporeans' perception of many issues facing the country (National reports: SIN p. 268). These issues clearly extend far beyond the countries mentioned here.

As an isolated phenomenon, the introduction of ESD as a topic or a perspective within a single subject or subject area (typically science) provides extremely limited possibilities to promote an understanding of ESD which brings (conflicting) connections between environmental, social, economic, cultural and political aspects of the major issues into play. If one encases ESD structurally speaking, within limited subject knowledge, one will have to make do with considerably lower ambitions.

Loftier ambitions can be found, for example, when the Presidential Commission on Sustainable Development (PCSD) in Korea writes: "ESD should be approached as the re-orientation of the whole education process not as an individual curriculum or educational content. The whole school initiatives should be encouraged to change the school ethos" (National reports: KOR, p. 213). There are a number of examples in the national reports of attempts to implement such a change in "ethos", structurally. A crucial precondition for any such effort is a school environment that supports interdisciplinary, problem-oriented and participatory work, and genuine support for ESD projects and programmes which otherwise run the risk of being squeezed out by the multitude of other agendas. As such, interdisciplinary work is generally reported to be more difficult to implement in secondary schools than in primary schools, in part due to heightened subject-specific agendas. In the UK and, not least, the US, it would appear that the "consequences of standards-based reforms have made American schools less hospitable for ESD" (National reports: USA p. 313).

REFLECTIONS
Just as it makes little sense to try to identify the one correct interpretation of ESD, or the one correct teaching method, it is pointless to try and identify a correct, universal structure for implementing ESD within the education system. Circumstances vary, traditions differ, and the context of implementation is never identical. In addition, the various structures seldom preclude one another, but, modified to fit the situation, can supplement each other. Nevertheless, it should be possible to learn something from the diversity.

THEME 4: BARRIERS RELATED TO DEVELOPMENT AND IMPLEMENTATION OF ESD/CCE

THE ISSUE
At first glance, one might get the impression that there exists a wealth of initiatives and goodwill in each of the participating nations which will ensure that ESD and CCE will develop in a manner satisfactorily reflecting the attention the field is afforded in international agreements. However, on closer inspection, the national reports reveal a number of more or less common barriers related to the development and implementation of ESD and CCE that are deserving of further consideration. For the sake of clarity, they are dealt with below under the following headings, although the issues are often interrelated:

> The balancing act between tackling long-term SD issues and more immediate economic imperatives
> Limitations in school organisation and practice
> Limited teacher qualifications for ESD and CCE
> Uncertainty and ambiguity regarding the concept of ESD
> Other constraints within the educational system.

FINDINGS
The balancing act between tackling long-term SD issues and more immediate economic imperatives
Generally speaking, globalisation has drawn attention to the competitiveness of the countries' workforce and students' performance within science in particular (CHN, DEN, KOR, SIN, UK). The effect on the educational system has been a greater focus on tests and performance indicators, and less willingness among teachers and schools to experiment with new approaches to teaching and learning. Both these factors impact negatively on the innovative, interdisciplinary and competence-centred aspects of ESD.

Certain pressing environmental issues might demand particular attention in individual countries such as drought and water shortage in Australia or rising sea levels in Singapore. Political factors can also play a role, such as the massive current focus in Denmark on reducing carbon emissions linked to the upcoming international climate summit in Copenhagen. Such priorities are, however, not necessarily tied to a broader effort to promote and develop ESD.

Limitations in school organisation and practice
The inspection of schools in the UK has given an indication of the reality compared to the political ambitions.

"There is a good connection between what is said in Australian policy documents and the initiatives that have been put in place." (National reports: AUS p. 14) and

Even if

"Some of the major structural initiatives of the plan are now in place, providing a firm foundation for further action", according to the Australian government (National reports: AUS p. 26).
Outcomes including enhanced academic achievement and pro-environmental behaviour – appears to be sustained participation in complex environmental projects that cut across disciplinary lines. Furthermore, the intervention strategies that have achieved the most compelling and well-documented success have all focused on “local participation” (National reports: AUS p. 346).

**Reflections**

Just as it makes little sense to try to identify the one correct interpretation of ESD, or the one correct teaching method, it is pointless to try and identify a correct, universal structure for implementing ESD within the education system. Circumstances vary, traditions differ, and the context of implementation is never identical. In addition, the various structures seldom preclude one another, but, modified to fit the situation, can supplement each other. Nevertheless, it should be possible to learn something from the diversity.

As an isolated phenomenon, the introduction of ESD as a topic or a perspective within a single subject or subject area (typically science) provides extremely limited possibilities to promote an understanding of ESD which brings (conflicting) connections between environmental, social, economic, cultural and political aspects of the major issues into play. If one encases ESD structurally speaking, within limited subject knowledge, one will have to make do with considerably lower ambitions.

Loftier ambitions can be found, for example, when the Presidential Commission on Sustainable Development (PCSD) in Korea writes: “ESD should be approached as the re-orientation of the whole education process not as an individual curriculum or educational content. The whole school initiatives should be encouraged to change the school ethos” (National reports: KOR p. 213).

There are a number of examples in the national reports of attempts to implement such a change in “ethos”, structurally. A crucial precondition for any such effort is a school environment that supports interdisciplinary, problem-oriented and participatory work, and genuine support for ESD projects and programmes which otherwise run the risk of being squeezed out by the multitude of other agendas. As such, interdisciplinary work is generally reported to be more difficult to implement in secondary schools than in primary schools, in part due to heightened subject-specific agendas. In the UK and, not least, the US, it would appear that the “consequences of standards-based reforms have made American schools less hospitable for ESD” (National reports: USA p. 313).

ESD does not revolve around structures, but structures influence what takes place within them. If interdisciplinary, issue-oriented and participatory teaching/learning is to be promoted, whole-school approaches and school-community collaborations will continue to be of considerable interest.

It will in any case be critical to identify structures which both enable and make it attractive to work with ESD in a way which counteracts the reactive tendency in which, as Singapore report notes, the populace tends to be reticent and takes a back seat. “The government knows best” is an apt description of Singaporeans’ perception of many issues facing the country” (National reports: SIN p. 268). These issues clearly extend far beyond the countries mentioned here.

The issue

At first glance, one might get the impression that there exists a wealth of initiatives and goodwill in each of the participating nations which will ensure that ESD and CCE will develop in a manner satisfactorily reflecting the attention the field is afforded in international agreements. However, on closer inspection, the national reports reveal a number of more or less common barriers related to the development and implementation of ESD and CCE that are deserving of further consideration. For the sake of clarity, they are dealt with below under the following headings, although the issues are often interrelated:

- The balancing act between tackling long-term SD issues and more immediate economic imperatives
- Limitations in school organisation and practice
- Uncertainty and ambiguity regarding the concept of ESD
- Other constraints within the educational system.

**Findings**

The balancing act between tackling long-term SD issues and more immediate economic imperatives

Generally speaking, globalisation has drawn attention to the competitiveness of the countries’ workforce and students’ participation within and outside their respective countries. In particular (CHN, DEN, KOR, SIN, UK). The effect on the educational system has been a greater focus on tests and performance indicators, and less willingness among teachers and schools to experiment with new approaches to teaching and learning. Both these factors impact negatively on the innovative, interdisciplinary and competence-centred aspects of ESD.

Certain pressing environmental issues might demand particular attention in individual countries such as drought and water shortage in Australia or rising sea levels in Singapore. Political factors can also play a role, such as the massive current focus in Denmark on reducing carbon emissions linked to the upcoming international climate summit in Copenhagen. Such priorities are, however, not necessarily tied to a broader effort to promote and develop ESD.

Limitations in school organisation and practice

The inspection of schools in the UK has given an indication of the reality compared to the political intentions for ESD:

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“The report also found that limited provision within individual subject areas – including citizenship, geography, science, and design and technology – resulted in few opportunities for the cross-curricular learning which government policy has advocated, although there was more evidence of this kind of learning in primary schools where planning more easily crosses subject boundaries” (National reports: UK p. 304).

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Even if

- - -

“While there is a good connection between what is said in Australian policy documents and the initiatives that have been put in place,” (National reports: AUS p. 14)

and

- - -

“Indeed the major structural initiatives of the plan are now in place, providing a firm foundation for further action,” according to the Australian government” (National reports: AUS p. 28).
As is underlined in the Chinese report:

\(\text{National reports: CHN p. 136}\).

The need for teacher qualifications in ESD is a general prerequisite if schools and education systems are to be capable of providing qualified ESD teaching, as explained in this extract from the Singaporean report:

\(\text{National reports: SIN p. 266}\).

And further:

\(\text{National reports: USA p. 329}\).

As underlined in the Chinese report:

\(\text{National reports: USA p. 156}\).

This statement related to an already crowded curriculum applies to a number of countries. In Canada, teachers, headteachers and parents experience ESD as additional content appended to the existing curriculum (CAN). This is an important barrier to achieving an engagement with ESD at the practical level (SIN, UK). If ESD is not prioritised at the policy level, it is more likely to be considered an extra burden and as secondary or luxury content by practitioners (DEN, USA).

Limited teacher qualifications for ESD and CCE

Despite national differences regarding the strategy for ESD development, teacher training is widely accepted as key to further development of ESD. In some countries (USA, CAN, CHN), NGOs have played a central role by training teachers and providing teaching materials, hereby facilitating competence development among practitioners within the field of ESD. Nevertheless, in all ten countries, there is a lack of sufficient teacher training that has a negative impact on schools’ engagement in and development of ESD. For example, in the USA:

\(\text{National reports: USA p. 129}\).

The above passage is also interesting in that it would seem to suggest that environmental issues are best dealt with from a science or geography perspective, for example, a citizenship perspective.

The limitations in the individual teacher’s ability to teach ESD not only restrict their own ESD teaching but also their involvement in ESD development as a joint challenge, making communication to teachers about related issues a more difficult task for the system.

Uncertainty and ambiguity regarding the concept of ESD

As demonstrated in theme 1, there exists a variety of interpretations of what ESD is and what ESD should be in each country. This variety can, in some respects, comprise a fertile field of development engaging researchers and practitioners in a common debate regarding what to focus on. However, when seeking to draw practitioners’ attention to ESD and encouraging them to incorporate ESD themes within their teaching, the conceptual ambiguity and lack of a shared understanding constitute a communication problem.

Other constraints within the educational system

As mentioned, an increasing focus on performance and the documentation of learning outcomes in many countries might function as a barrier for ESD development, as described here in the UK report:

\(\text{National reports: UK p. 296}\).

Especially the high risks involved for some stakeholders are underlined in the report from Singapore:

\(\text{National reports: SINGAPORE p. 266}\).

The Chinese government and educational researchers have been trying to change the ‘education for exam’ to quality education that values the needs, competence and happiness of individual students rather than merely mastering book knowledge and getting high scores in tests (National reports: CHN p. 119).

This is obviously not an easy ambition to fulfil in a hard pressed educational system with limited resources in many schools especially not as long as the exams are linked to “education for entering a higher school” (National reports: CHN p. 136).

Adding to the general problem that ESD has to compete with the ‘traditional’ subjects for space in the curriculum and teachers’ engagement, in some countries we find little or no focus on the progression of ESD during the period of compulsory schooling, described in the Chinese report as a lack of differentiation (CHN).

REFLECTIONS

The barriers described above are often interrelated. This means that any major improvement to the situation must involve addressing a number of issues more or less at the same time at the policy level. This will also generate certain synergy effects. If teachers have a basic background for teaching ESD they will also be far better equipped to engage in ESD development, thereby facilitating communication from the policy level to the practitioner level. If teachers are communicating, adequate support structures are in place, and regulations exist underlining the importance of ESD, the system will function much better as a whole.

When ESD is first introduced within schools, it is a common situation that only a small handful of teachers find the role as local pioneers and innovators stimulating and engage personally in the development of ESD. These pioneers may play an important role as activists at the local level due to their passion and enthusiasm, but in the long run, ESD has to be adopted as more of a common challenge for the school if it is to become mainstream. One challenge in implementing innovative forms of ESD is finding ways in which to ensure that this passion and enthusiasm spread to colleagues instead of overwhelming them, thereby encouraging inclusiveness and participation in the continuing development and innovation.

The national reports do not provide evidence of a clear pattern of differences in the main barriers for ESD development between the established industrialised countries and the countries characterised by more recent industrialisation. This probably has to do with the existence of greater variation within each individual country than found between countries at the overall level. It might also have to do with a lack of national baseline studies which might enable such a comparison. However, this would require a more explicit articulation of an ESD position in each country than currently found to be truly meaningful. Nevertheless, varying national and local needs and challenges mean that important differences in national ESD priorities are to be expected, and thereby also differences in the main barriers to overcome.

It might have been possible to identify a pattern in the barriers to implementing and developing ESD in the form of different educational traditions clearly reflected in the approach to ESD and ESD development, and, for example, to demonstrate differences between centralised and decentralised school systems, but the national reports do not support any conclusions regarding such differences.

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The above passage is also interesting in that it would seem to suggest that environmental issues are best dealt with from a science or geography perspective, for example, a citizenship perspective.

The limitations in the individual teacher’s ability to teach ESD not only restrict their own ESD teaching but also their involvement in ESD development as a joint challenge, making communication to teachers about related issues a more difficult task for the system.

Uncertainty and ambiguity regarding the concept of ESD

As demonstrated in theme 1, there exists a variety of interpretations of what ESD is and what ESD should be like in each country. This variety can, in some respects, comprise a fertile field of development engaging researchers and practitioners in a common debate regarding what to focus on. However, when seeking to draw practitioners’ attention to ESD and encouraging them to incorporate ESD themes within their teaching, the conceptual ambiguity and lack of a shared understanding constitute a communication problem.

Other constraints within the educational system

As mentioned, an increasing focus on performance and the documentation of learning outcomes in many countries might function as a barrier for ESD development, as described here in the UK report:

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Alongside active efforts to promote learning about and for sustainable development in the UK, however, over the last ten to fifteen years there has also been an increasing emphasis on standardised assessment within formal education. Many educators worry that this trend is undermining the overall quality of education in the UK, and that it poses particular challenges for the mainstreaming of topics such as sustainable development, which require a greater attention to learning processes than to outcomes (National reports: UK p. 298).

Especially the high risks involved for some stakeholders are underlined in the report from Singapore:

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The Chinese government and educational researchers have been trying to change the ‘education for exam’ to quality education that values the students rather than socially critical and emancipatory in character (STU, 2008; Wong, 2003) (National reports: SIN p. 266).

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Incorporating EE/ESD aspects in exams would give impetus to focus on EE/ESD (SIN).

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More specifically, the roots of ESD in the different countries have some similarities linked to the national development of EE. There are differences regarding which concept of EE has been dominant, and consequently in the ease with which EE has developed into an ESD approach focusing on students’ empowerment and encompassing not only environmental, but also economic and social aspects.

It seems plausible that a focused effort to merge and develop established views on education such as health education, global education, conservation education and citizenship education, along with EE, into a more forward looking version of ESD would help to overcome some of the specified barriers.

In China and Singapore, considerable efforts have been made during recent years to make the learning situation more meaningful for students (CHN, SIN). In such cases, ESD can act as a catalyst for efforts to improve this. Interestingly, this tendency goes against another international trend mentioned as one of the barriers hindering the implementation and development of ESD in some countries, i.e. the increasing focus on standardised curricula linked to a quest for tests and performance indicators (e.g. DEN, UK, USA).

To overcome barriers to the future development of ESD, it might be helpful to develop cumulative models of ESD which incorporate progression throughout the various stages of compulsory schooling, and to consider how best to gain the full potential of ESD at each level of the national educational system. Doing so can assist in the integration of ESD within the curricula, but will require considerable national attention and research. On the other hand, too rigid and restrictive a focus on educational progression should be avoided as it can hamper the genuine participation of students allowed to focus on issues that they find important.

Research has not played its cultural role within a closed theoretical–academic vacuum, but in dialogue with other institutions and stakeholders. This dialogue has, as outlined under theme 1, been characterised by a critical polemic against a behavioural, prescriptive approach and a desire to develop alternative approaches, as far back as the early days of EE. This is particularly apparent in the Danish report and the report from the UK, which comments on this trend at length:

"The first point to be made is that research has assumed a role that we earlier referred to, using a term from de Vries, as ‘the cultural role’. By this we mean that research has played a significant part in formulating and interpreting the concept of ESD. Partly critical, partly innovative, research has contributed to discussions on the theoretical foundations of ESD, the development of possible pedagogical approaches and principles, and strategies for shaping and evaluating ESD practice directly. The national reports illustrate this in various ways."

In the midst of the UN Decade for ESD and the growing awareness of the risks of climate change, politicians worldwide have expressed a desire to intensify efforts within this field. The question is, what impact this will have on practice at school level? What are educators doing and what could they do? How can the quality of the teaching/learning in ESD be gauged, and how can it be improved? Research comprises a key component in answering each of these questions. UNESCO has therefore also recognised research as an essential component of success for the Decade for ESD.

In this chapter, we will take a closer look at the roles research has played so far in the development of ESD in the ten countries represented in this report. We will examine both the role of research in the development of policy and its role in the development of practice. What can we learn from these past experiences with research in ESD? Are there any general characteristics or defining features of this research? What differences are there among the different nations? How has the tension between analytical distance and policy/practice collaboration been negotiated? And, looking to the future: On the background of the various strengths and weaknesses identified in current and previous research efforts, what recommendations can be made regarding the development of ESD research in the coming years?

The cultural role – critical and innovative

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Overall, since the 1970s there has been, and continues to be, active debate in the UK about how educational programmes might lead to behavioural or attitudinal change in support of sustainability. These debates have also recently begun to be applied to discussions of education and climate change. Government-funded research and policy tends to take an instrumental approach to education and training in...
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THEME 5: RESEARCH

THE ISSUE

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FINDINGS

A relatively new field of research

Just as ESD and CCE constitute relatively new themes within education, research in this area is also relatively new and, as yet, quite sparse. However, the national reports demonstrate that the existing research on ESD is closely linked to, and indeed often has its origins in, the field of environmental education—a field with a considerably longer history (CAN, UK, SIN, KOR, CHN, ALG, BRA, DEN, USA). In addition, development education (UK) and health education (DEN) are sometimes highlighted as areas of educational research that have dealt with ESD. As a result of these mixed origins, research has actively influenced ESD since the start of the UN Decade in 2005. In the following pages, we will illustrate the various roles of research in this process.

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Research has not played its cultural role within a closed theoretical-academic vacuum, but in dialogue with other institutions and stakeholders. This dialogue has, as outlined under theme 1, been characterised by a critical polemic against a behavioural, prescriptive approach and a desire to develop alternative approaches, as far back as the early days of EE. This is particularly apparent in the Danish report and the report from the UK, which comments on this trend at length:
Advocates recognize the need for a strong research base in order to understand the effectiveness of ongoing education efforts and to determine how best to proceed in the future (cited in National reports: AUS p. 14).

This intertwining of research and policy is institutionally anchored within the Australian Research Institute in Education for Sustainability (ARIIES), which is situated at Macquarie University, Sydney and primarily funded by the Australian Government Department of the Environment, Water and Heritage and the Arts. As well as providing a strong bedrock for the dialogue between research and policy in terms of resources and organisation, it should also be noted that this type of association between research and policy involves the risk that research becomes tied to contractual obligations. At ARIIES and other government or state apparatus that is responsible for ESD policy, as was the case in Korea and Denmark. The report from USA analyses the development of ESD from a governance perspective, where the key stakeholders are the federal government, state governments and NGOs (USA). The governance perspective makes sense, also in relation to the dialogue in the other countries referred to here, though it demonstrates the variations among countries regarding which stakeholders are involved in policy development. As well as a source of concrete policy development, the dialogue among stakeholders can also be viewed as the development of an ESD discourse and a source of new knowledge. ESD and CCE are examples of issues that are defined and negotiated with researchers as one of several parties involved. This places new demands on researchers, and requires a great degree of reflexivity concerning their own position and the importance of maintaining standards of scientific quality and honesty.

With this development in the forms of knowledge production in mind, a number of the national reports contain interesting examples of alternative to the classic expert role. It is not just a matter of improving the dissemination of the experts’ knowledge, but of creating a dialectical, reciprocal learning relationship between the researchers’ theories and teachers’ practical knowledge. In Singapore, universities work in dialogue with local communities:

- The documentary role

It is perhaps predictable that ESD research has had an innovative and developmental role in conjunction with the introduction of ESD. It comes as a surprise that research is in a weak position when it comes to documenting practice. Keeping in mind UNESCO’s recommendation that research be used to support the development of ESD during the UN Decade, one might expect that now, at the halfway point, there would be an extensive body of research on national initiatives, including both surveys of the ESD-related efforts and evaluations that could provide insight into existing projects and support their development. Despite sporadic examples, to the contrary, the general impression gained from the national reports is that such studies are lacking. In the following pages, we will provide a clearer picture by distinguishing between documentation in the form

- Participants decided that the Partnership would not design or implement programs of its own. Rather, it would serve as a clearing house – helping to connect, highlight, and foster collaboration among participants – and serving as a catalyst to convene partners and build community to support existing and emerging initiatives (USPESD in National reports: USA p. 33).

The opportunity for ESD researchers to play the role of mediators who network and catalyse knowledge and competence development among ESD stakeholders and practitioners is now supported on a global level by the United Nations University which has, so far, recognised 60 Regional Centres of Expertise around the world. All such centres share the goal of developing ESD within networks that include universities. At one of these centres, situated in Tongyoung, South Korea, a number of university departments have established a Centre for Education for Sustainability and the local community on the development of ESD (KOR).
these areas – i.e. that increasing access to knowl-
edge and discussion of topics will result in change.
There is a strong critique of this approach from some
researchers who are concerned that some educational
programmes (particularly labelled ESD/ EE/DE or CCE) in
practice are often too instrumenta-
lar in their aims (e.g. gaining support for particular
perspectives, initiatives or campaigns) because they
rely on an overly simplistic understanding of
learning.” (National reports: UK p. 306ff)

In the USA and, in particular, in Canada, researchers
have initiated a debate regarding the terms ESD itself
(cf. Theme 1), accusing its proponents of underesti-
miting the environmental dimension of EE and replac-
ing it with an anthropocentric development perspec-
tive (USA, CAN). This reflects differences in the
interpretation of sustainable development, but also
demonstrates that ESD researchers have taken an ac-
tive role in the conceptual evolution of SD and ESD,
and in drawing attention to the consequences.

As time passes and people, societies and nature
change, those changes give cause for new considera-
tions regarding ESD. The role of researchers as both
educators and innovators in the conceptual develop-
ment of ESD is not strongly represented in all of the
national reports, but there are examples from
Denmark, Korea and Singapore which highlight the
development of the ‘green growth’ discourse in these
countries, which has had strongly influenced the percep-
tion and practice of ESD.

Research’s cultural role has predominately involved
critical reflection, but the other side of the cultural
role, making constructive suggestions for alternatives
and new ways of understanding and doing things, is
also discernible in the reports. As described in
earlier chapters, the shift from EE to ESD can be
considered problematic, but the widespread criti-
cal discussion surrounding this shift can also be seen
as a progressive trend, one that has advanced the
discourse from nature to environment to a more
holistic perspective tied to the concept of sustainable
development (CSD). With ESD and its status as a global
issue and the possibilities for international compari-
sion, there is great potential for an augmentation of
the unique aspect of research’s cultural role, as
suggested in the UK report.

Research as a source of expertise
in ESD policy

In some countries, the cultural role of ESD research
has been combined with direct involvement in
policy development. The clearest example of this
can be found in Australia. A review of Australian progress
in ESD, compiled by Sustainability and Education
Academy, York University in Canada, concluded.

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- Closely intertwined with policy development, research has
played a vital role in promoting ESD in Australia.

Advocates recognize the need for a strong research
base in order to understand the effectiveness of ongo-
ing education efforts and to determine how best to pro-
ceed in the future” (National reports: AUS p. 118).
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This intertwining of research and policy is institu-
tionally anchored within the Australian Research
Institute in Education for Sustainability (ARIES),
which is situated at Macquarie University, Sydney
and primarily funded by the Australian Government
Department of the Environment, Water and Heritage
and the Arts. As well as providing a strong bedrock
for the dialogue between research and policy in terms
of resources and organisation, it should also be noted
that this type of association between research and
policy involves the risk that research becomes tied to
contractual obligations. At ARIES, for example, the
objective is politically defined as conducting research
on “how to move beyond simply raising awareness to
achieve the attitudinal and behavioural changes
necessary to live sustainably” (National reports: AUS, p. 20). This framing of the research objective sets lim-
its on what constitutes a relevant research question.
Furthermore, fulfilling this objective is problematic.

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- “However, it should be noted that much of the work
of ARIES is descriptive rather than analytical. That
is, while what is being done in a range of ways is
documented by ARIES, the effectiveness of pro-
grammes to lead to changed attitudes or behaviour is
less well understood. This is somewhat unsurpris-
ing, as making causal links between an educational
program and behavioural change is challenging” (National reports: AUS p. 20).

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In some countries, the link between policy and
research is not institutionalised in the same way,
but there exists a close link nevertheless. In both
Denmark and Korea, researchers have been actively
involved in preparing their respective national strate-
gies for ESD. In the case of Korea, the report stresses
the positive, stimulating dialogue between researchers
and other stakeholders. At first, this took the form of
a joint research project which resulted in the compi-
lcation of a draft of the national strategy. Subsequently,
a new cooperative process ensued:
- The draft was shared during several meetings
with various stakeholders, including government
officials, local Agenda 21 representatives, teachers,
NGO representatives and researchers. Such a proc-
ess contributed to information sharing and triggered
discussions and debates on ESD among stakehold-
 ers involved” (National reports: KOR p. 206).

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- The development of the Danish ESD strategy is a
similar example of dialogue among researchers, gov-
ernment officials and other stakeholders. In this case,
the researchers were asked to draft a foundation for
a Danish strategy. As is clear from the Danish report,
the interaction between input from researchers and
the wider public and the political system proved to
be somewhat difficult:

- “The presentation [of the researchers’ draft] for the
national ESD strategy was submitted to the Ministry
in August 2007, that’s more than 1½ years before
the adoption of the finalised strategy, but here, only
a handful of passages remain which in itself makes
it fairly apparent that there is a considerable diver-
gence in perspectives” (National reports: DEN p. 158).

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- In several countries, there is no talk of dialogue
among stakeholders. At ARIES, a national government
or state apparatus that is responsible for ESD policy,
as was the case in Korea and Denmark. The report
from USA analyses the development of ESD from a
governance perspective, where the key stakeholders
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sense, also in relation to the dialogue in the other
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the variations among countries regarding which
stakeholders are involved in policy development. As
well as a source of concrete policy development, the
dialogue among stakeholders can also be viewed as
the development of an ESD discourse and a source
of new knowledge. ESD and CCE are examples of
issues that are defined and negotiated with research-
ers as one only of several parties involved. This
phases new demands on researchers, and requires
a great degree of reflexivity concerning their own
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- As argued by the sociologist of science Nowotny, Scott and Gibbons, research has less and less of a patent on the production of knowledge. Knowledge is produced within networks of actors where the nature of knowledge, of course, have a special role (Nowotny, H., P. Scott, et al. (2001) ‘Re-thinking science, knowledge and the public in an age of uncertainty’, Oxford, Polity Press).
of monitoring and the form of quality assessments, and, for the latter, between formative and summative assessments. Monitoring offers a description of what is happening in practice, whether qualitatively or quantitatively. It does not provide explanations or contribute to qualitative research-based proposals for the refinement of practice. A handful of examples of ESD monitoring are given in the national reports. Australia, which began earlier than the other nations and which has funded an actual research institution for ESD, is an obvious outlier. In Australia, several studies have been conducted that describe the practice of ESD. These studies have concentrated in particular on how ESD is taught and on the implementation of the whole-school approach (AUS). The UK report also refers to monitoring work, including both a survey of several key government departments concerning good practice in curriculum planning and whole-school approaches to sustainability, and a survey of young people’s attitudes to global learning and how the practice of ESD learning on the ground (UK). In Singapore, a large-scale survey into students’ general perceptions of sustainability was conducted in 2006 and has helped in gaining an understanding of the situation (SIN).

Unlike this purely descriptive documentation, researchers’ role as formative evaluators involves data analyses that seek to provide input for the refinement of practice. Formative evaluation makes it possible to explain the strengths, barriers, and possibilities, and, on this basis, to develop qualified suggestions as to ways forward. In the national reports, there is a number of examples where researchers has been involved in developmental and action research projects, as well as in formative project assessments with the goal of supporting concrete development processes (KOR, CHN). Each project is of great value to the projects evaluated, but researchers also argue for the broader relevance of such evaluations, which can be enhanced by knowledge sharing between researchers and practitioners. One example is the Scandinavian MUVIN project that generated a number of conclusions regarding, among other things, what student value in EE (DEN). Although there are many organizations that might foster this form of knowledge sharing, including the previously mentioned RCE for ESD, the national reports contain only a single notable example. In the United States, the NGO North American Association for Environmental Education (NAAEE) has developed and continues to refine guidelines for excellence within EE. These guidelines are:

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“…not a summary of research on ‘what works’. They are the fruit of a conscious process, involving more than a thousand practitioners, that was intended to produce ‘a common understanding of effective environmental education’ (NAAEE 2004)” (National reports: USA p. 337).

Unlike formative assessment, summative assessment has to do with the results of a particular initiative, with less focus on shaping future practice. There is generally a lack of research focusing on the evaluation of such initiatives. In such research, researchers that both monitors what has happened and assesses the value of the results – usually in relation to predetermined success criteria and indicators. Despite this, there are few examples of this type of ESD research. In the UK, a government body assessed the work of several key government departments in 2003. The study “found evidence of good practice in curriculum planning and whole-school approaches to sustainability, but concluded that more could be done to fully integrate ESD across the curriculum” (National reports: UK p. 297).

In South Korea, whole school projects have been successful in engendering environmentally friendly outcomes among students towards ESD. Furthermore, at study on a sample of Environmental Conservation Model School Initiatives revealed positive contributions of such endeavours towards sustainable development, but did also identify aspects where the schools achieve low accomplishment (KOR).

In China, a study has documented that teachers who have participated in a major ESD project have developed attitudes, interests, awareness and teaching abilities within the ESD area (CHN). The US report confirms that this kind of research is still rare, but as a significant exception to the rule – a summary of multiple tests of the teaching strategy Investigating Environmental Education Issues and Actions (EEIA), and Environmental Education Project for Primary and Secondary Education, conducted over a period of 20 years. Although these tests contain ‘persistent methodological weaknesses’, they are remarkably consistent.

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In each of the eleven cases, the students participating in IEEIA exhibited some type of environmentally oriented behaviour change. In the cases, behaviour change was accompanied by shifts in other skill, knowledge and attitudinal variables…” (National reports: USA p. 345).

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There can be grounds for taking a closer look at why summative assessment, despite being much in demand from policymakers, is so thin on the ground in North America (CAN). The national reports have been the focus of considerable formative assessment, it can not be purely a result of the relative newness of ESD. The Australian report concludes the following regarding ESD research:

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‘There appears to be limited research on the impacts of ESD initiatives, impact being defined as ‘the impact on policy, on educational institutional or curricular policy, or on educational or other aspects of activity policy and programme and embodies lasting changes’. Such studies would need to be longitudinal and complex, and separating out the influences of specific initiatives at school would be difficult’ (National reports: AUS p. 41).

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As inferred here, the stumbling block for this form of research, and thus for meeting the demand from policymakers, may the methodological difficulty involved. There is a paucity of research on how ESD, CCE or EE policy is being implemented, and its impact on schools and classrooms. Reports that do exist come from government bodies and other organizations active in the area. These self reports tend to be uncritical catalogues that focus on successes, and are silent about problems and failures. This research gap may reflect a deeper systemic weakness, that is, the lack of emphasis on research in influencing policy and practice. On the other hand, the current research gap may exist because plans surrounding ESD cannot provide a basis for taking further steps in the exploration of the socio-cultural shaping of ESD by means of international comparison.

Evaluating the effectiveness and, more broadly, the value of ESD activities requires a degree of consensus about what ‘effective’ ESD looks like. There are weaknesses in the ongoing dialogue between policymakers and ESD researchers regarding what quality criteria and methods of inquiry can be used to assess results within the field of ESD is key to improvements in this area. It is a case of registering environmental results, e.g. reductions in carbon emissions, or is it about what ESD can do for ESD? Because SD concerns ongoing processes of global change, ESD must be kept up to date if it is to support SD through learning processes stretching from the global to the personal level.

Reflections

As has been apparent, research can play several roles in the development of ESD. The focus within the political and the research agenda on research as documentation and clarification involves a risk of overlooking researchers’ possible role as ‘critical friends’ and innovators. This role can be particularly important for such a young and uncertain field as ESD. Because SD concerns processes of global change, ESD must be kept up to date if it is to support SD through learning processes stretching from the global to the personal level.

Research also has an important role to play as a reflective participant in knowledge sharing networks alongside teachers and other ESD practitioners. Regional Centres of Expertise comprise a potential platform for developing this mediation, but there is a risk that research will remain too closely linked to developmental projects in collaboration with the most committed practitioners (formative project assessments can also be included here). Research must also deal with and expand on normal ESD practice.

Regarding the latter, there is first and foremost a need for larger-scale studies that offer a detailed
of monitoring and the form of quality assessments, and, for the latter, between formative and summative assessments.

Monitoring offers a description of what is happening in practice, whether quantitatively or qualitatively. It does not provide explanations or contribute to knowledge and research-based proposals for the refinement of practice. A handful of examples of ESD monitoring are given in the national reports. Australia, which began earlier than the other nations and which has funded an actual research institution for ESD, is an obvious outlier. In Australia, several studies have been conducted that describe the practice of ESD. These studies have concentrated in particular on how ESD is taught and on the implementation of the whole-school approach (AUS). The UK report also refers to monitoring efforts, including both a survey of several key government departments concerning good practice in curriculum planning and whole-school approaches to sustainability, and a survey of young people’s attitudes to global learning and how the practice of ESD learning on the ground (UK). In Singapore, a large-scale survey into students’ general perceptions of sustainability was conducted in 2006 and has helped in gaining an understanding of the situation (SIN).

Unlike this purely descriptive documentation, researchers’ role as formative evaluators involves data analyses that seek to provide input for the refinement of practice. Formative evaluation makes it possible to explain differences, barriers, and possibilities, and, on this basis, to develop qualified suggestions as to ways forward. In the national reports, there are a number of examples where research has been involved in developmental and action research projects, as well as in formative project assessments with the goal of supporting concrete development processes (KOR, CHN, DEN). Such projects are of great importance for supporting concrete development processes, but did also identify aspects where the schools achieve low accomplishment (KOR). In China, a study has documented that teachers who have participated in a major ESD project have developed attitudes, interests, awareness and teaching abilities within the ESD area (CHN). The US report confirms that the latest report of the PECL project in ESD. Furthermore, at study on a sample of Environmental Conservation Model School Initiatives revealed positive contributions of such endeavours towards sustainable development, but did also identify aspects where the schools achieve low accomplishments (KOR).

Unlike formative assessment, summative assessment has to do with the results of a particular initiative, with less focus on shaping future practice. There is generally a need for evaluative research. Such research presupposes that both monitors what has happened and assesses the value of the results – usually in relation to predetermined success criteria and indicators. Despite this, there are few examples of this type of ESD research. In the UK, a government body assessed the work of several key government departments in 2003. The study “found evidence of good practice in curriculum planning and whole-school approaches to sustainability, but concluded that more could be done to fully integrate ESD across the curriculum” (National reports: UK p. 297).

In South Korea, whole school projects have been successful in engendering environmentally friendly outcomes among students towards ESD. Further, at study on a sample of Environmental Conservation Model School Initiatives revealed positive contributions of such endeavours towards sustainable development, but did also identify aspects where the schools achieve low accomplishment (KOR).

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overview of, and insight into, the issue of ESD-studies that illustrate the issue both quantitatively, qualitatively, and developmentally. However, as is evident, there are still methodological problems in this regard, intimately connected with ongoing discussions about the proper purposes and outcomes of ESD. The dialogue between the policy level and ESD researchers must continue with the objective of establishing a greater understanding of the particular challenges involved in documenting students’ learning and utilisation of competences in relation to a complex issue such as sustainable development.
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