Indicators for Education for Sustainable Development: a report on perspectives, challenges and progress

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December 2006

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Acknowledgements

The Anglo-German Foundation, the Royal Society for the Protection of Birds, the Field Studies Council, and the University of Bath supported this research. The UK’s Economic and Social Research Council supported preparatory work through its Social Science Week activities.

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Executive Summary

This document reports on contemporary perspectives, challenges, and progress in the development and implementation of indicators for Education for Sustainable Development (ESD) in 2006.

The report discusses:

- key issues in indicator methodology and the application of indicators to the field of ESD;
- existing and emerging critiques of indicators in social policy settings; and
- a range of ESD indicator projects underway in Europe.

Overview

Amid the growth of interest in promoting and developing sustainable development (SD) policy and practice over recent decades, indicators have become a prominent evaluative tool in monitoring and appraising achievements and progress in relation to SD. According to UNESCO (2004), SD implies socio-economic change and the ‘reorientation’ of society towards ‘sustainability’. This requires socio-ecological transformations at local to global scales towards SD processes, alongside an increase in diverse people’s capacities to transform their visions for a sustainable society into reality. Accordingly, ESD broadly defined as any educational endeavour focusing on SD ideas, must address the view that SD is likely to pose new challenges to historic and current educational processes and their conceptualisations, and in view of that, UNESCO has called for a re-orientation of educational approaches – for example, curriculum frameworks and content, pedagogies and examinations – in terms of how education addresses and contributes to SD.

Indicators have a history of use in education, and as this report shows, are increasingly used at the interface of educational initiatives that attempt to contribute to SD. Here, ESD indicators are being used to inform judgements, decision-making and actions regarding quality, change, and their effects on an educational system, through the evaluation and monitoring of key processes, structures, resources, and outcomes.

This report emerged from a seminar on ESD indicators with stakeholders from England, Germany, the Netherlands, Spain, and Sweden, hosted by the Centre for Research in Education and the Environment (University of Bath), in June 2006. Participants were from government, schools and the HE sectors, and included policy makers, researchers and academics, and representatives of user groups, e.g. teachers and students in the formal and informal education sectors. The timing of the event in Bath was such that stakeholders involved in drafting, preparing and evaluating proposed indicators for ESD were brought together amid the various national and international processes to develop ESD indicators, and before any final ratification of ESD indicator sets for national governments and intergovernmental agencies that they were involved in had taken place.

In particular, the seminar examined the state of the art in the development and application of ESD indicators in England and Germany, and the debates and issues these raise for policy, theory and practice in relation to ESD and indicators, at local, national and international levels.

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Key arguments and findings

1. Indicators are proxy measures, based on models, systems and expectations that strongly influence their value and the uses to which they can be put

Indicators are proxy measures designed to make information about a system intelligible to the indicator users, where direct measurement is not possible. They typically aggregate and simplify relevant and reliable data (quantitative and / or qualitative) for some of the following purposes:

- to simplify or distil complex information about the features of the system
- to monitor or account for the performance of systems in ongoing and systematic ways against desired or reasoned conditions, reference points or expectations (e.g. for processes and components, to chart and evaluate the effectiveness of resources spent on a policy, programme or innovation)
- to measure the state, direction and rate of change (e.g. ‘progress’) and compare it over time and context (e.g. benchmarking) with reference to its links to a model, yardstick, or outcomes
- to act as a ‘warning’ system to point to unfavourable developments or system states
- to raise awareness and communicate information and trends to decision-makers, stakeholders and the public-at-large, e.g. about strengths and weaknesses of current practice or policy
- to stabilise processes (particularly implementation) through, for example, generating profiles of data and target setting
- to aid accountability, governance, decision-making, dialogue, planning, and reform, and address stakeholder interests about the present and future state of the system under consideration.

Although the report discusses experiences and expertise in indicators, it does not offer practical guidelines on how to develop ESD indicators or what types of data should be collected for particular functions. This is available elsewhere, most notably in the work of the UNECE Expert Group on Indicators for ESD 4, and the UNESCO-IUCN CEC Asia-Pacific DESD Indicators Project 5 in their reports, guidance, working papers, toolkits and case studies.

2. A need for clarity and openness about indicator purposes and interpretive frameworks

The majority of contributions to the seminar illustrated the commonly-held perspective in this field, that ESD is a multi-dimensional and contested concept whose effectiveness cannot be easily assessed by only one universal indicator or indicator set 6. Definitions of and contexts for ESD and its implementation differ and so, accordingly, indicators used to describe, monitor and evaluate ESD should be expected to differ too. By way of illustration, some ESD projects or initiatives emphasise the quality of inputs to ESD in an educational system, whereas others emphasise the quality of processes and outcomes. This reflects wider and diverse perspectives on the purposes and processes of both education and SD, how it is modelled and measured directly and indirectly, and the degree of focus that should be put on some sectors and goals over others.

Here, tensions emerge around the degree and extent to which indicators as proxy measures should focus on formal, non-formal and / or informal education in ESD; and on participatory, bottom-up, or emancipatory SD approaches in contrast to prescriptive, top-down, or instrumentalist ones. Deliberative processes are helpful here to ensure that sets of indicators

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4 See the project website: http://www.unesc.org/en/esd/ESC_EG1.htm.
work across ESD types, contexts and implementation strategies, measure what they intend to measure (i.e. are valid regarding coverage of themes and objectives, and their purported contributions to SD), and do this consistently over short timescales (i.e. are reliable). Other key requirements are that indicators meet practical criteria related to feasibility and suitability in terms of time, cost and expertise required to collect and process data, and are readily understood and interpretable by a broad audience of educators, policy-makers and the public-at-large.

It was also recognised at the seminar that it is often difficult for an educational system to meet all expectations or needs in relation to a model or strategy for ESD at the same time. Thus, in the perception of some constituencies and stakeholders, certain indicator measurements may be judged to represent high performance, while in the view of others, that of low performance within the system (e.g. regarding the relative merits of standardising assessment of ESD learning outcomes). These judgments too will vary over time. In other words, based on different conceptions or models of ESD and different concerns about how it is best developed, implemented, or evaluated over time, different stakeholders prefer different foci and strategies to achieve ESD and champion different indicators of success or progress in guiding measurement.

This situation creates difficulties in interpreting indicator sets: how components work together to produce an overall effect at different points in time, and in identifying and interpreting how and whether logical, assumed or empirical links work together to produce the overall picture. Furthermore, no single model of ESD or implementation has been universally accepted, despite the widely shared views that are available. This creates dilemmas for and tensions in the selection, construction and interpretation of indicators, particularly when a model of ESD or implementation remains partial or contested; or when system complexity and sophistication make strong demands on the techniques for aggregating and reporting data. Therefore, policy-making on ESD indicators must proceed with caution and demand clarity regarding indicator frameworks and intelligibility.

3. Recognition of the costs and opportunities in developing a robust, rigorous, and meaningful indicator set for ESD that works across specific contexts

Given this state of affairs, it was of little surprise that seminar and workshop participants illustrated how the models of ESD that indicators refer to were not universal in all situations, and that a model’s usefulness has often been limited by contextual conditions, e.g. as they relate to policy and practice contexts for education, SD, and evaluation in England and Germany. Thus one model or set of assumptions about ESD may be applicable in some specific contexts and not in others, e.g. in Germany, in relation to the recognition and promotion of the concept of ‘Gestaltungskompetenz’ in ESD, a set of goals related to futures-oriented competency outcomes and the curriculum that is simply not mirrored in England (see Nickel & Reid, 2006) 7.

However, little thought to date appears to have been given to the costs and demands of establishing comprehensive and systemically attuned indicator systems that can work with this at a meta-level. This may require bridging alternative goals for education systems, for example, or the histories and cultures of education across diverse nations or states where ESD may either build on, strengthen or rupture existing practices or gains in related fields, e.g. in Germany and England, environmental education, development education, global learning and citizenship education. In other words, while the tools may be there (the indicators), the incentives for using them and using them well, can vary extensively. Thus a key challenge for transnational indicator sets is ensuring their robustness and flexibility, and addressing their likely incompatibilities and incongruities in relation to international benchmarking purposes when and where there are substantial differences in the purposes, practices and policies, and histories and cultures of diverse educational systems.

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Similarly, it was widely acknowledged that when some quality criteria of ESD are strongly emphasised by indicators and their advocates, and energy and resources are concentrated on the attainment of associated goals, other aspects of ESD – i.e. its other components, interpretations, or possible implementation strategies – will tend to be neglected. In part, this seemed to reflect the degree to which proposed indicators could be seen to pursue ‘quick wins’, or capitalise on or prioritise existing monitoring systems, or a preference for monitoring systems that are currently ‘data rich’ rather than ‘data poor’, or easy to compile and interpret. There was also a strong desire (practically and politically) to see ESD indicators integrated and linked with existing monitoring and evaluation systems (e.g. school inspection, PISA, and Eurostat-type approaches), rather than developing new ones, given the relatively few resources available to those aspects not considered mainstream to education. But we should also recognise here the power of some discourses about ESD over viable alternatives or resistances to those discourses, e.g. in relation to the UN’s Decade for Education for Sustainable Development. Here, we might note that there are risks that as with any dominant discourse, it may distort practices and narrow conceptions and possibilities, if conceptual and pragmatic energies and resources are focused on, for example, one model to the expense of others, or one strategy or implementation goal over others.

Thus, here too we should note that since the performance of one part of a system influences others, and that practice may precede policy (rather than the other way around), questions of focus and balance must be addressed in developing, applying and reviewing ESD indicator sets:

(i) in the timing and extent of using and interpreting a set of ESD indicators;

alongside in relation to (i), those matters related to focus and balance regarding:

(ii) the preferred models and models-in-use for ESD and its implementation,

(iii) the indicators that act as corresponding measures of different aspects of performance, and

(iv) the conditions within which the indicators and evidentiary base are found or constrained.

Thus, for ESD indicators to be credible, meaningful and comparable, it makes sense that concrete and logical links to wider areas are in evidence, and the demonstration of interdependence, particularly if political capital is to be maximised not only in relation to education and environment policy typically, but also increasingly in relation to National Action Plans for SD.

These issues are discussed in the main report in relation to historical and contemporary examples of indicators from England, Germany, and the UN Decade for ESD (2005-14), as well as other European and international indicator initiatives such as those associated with Agenda 21 and the UNECE Strategy for ESD.

**Policy implications and recommendations**

In terms of implications, attention should be given to the following features of indicators for ESD:

1. **Quality of ESD should not be equated with indicator measurements.** While indicators can serve enlightenment and engineering purposes in relation to the use of knowledge of the performance of a system, these purposes are limited by the measurement technologies available, the models of the education system and its measurement, and the uses to which ESD indicators can be reasonably and legitimately put, particularly in terms of validity and reliability. This is because indicators for models of the social field only work probabilistically at best, and while the pattern of indicator information may cohere and may make sense, it is far from complete in terms of direct and accurate measurement of the system, and of explicitly linked, measurable, causal variables, i.e. indicators remain proxies and work with a simplification.
2. **To ensure stakeholder trust in indicator sets, both the assumptions that underpin the models of the systems, and the indicators themselves must be made clear and available.** For example, SD is often seen as an organic process rather than a mechanistic one, and so indicators might be expected to be consistent with that understanding in some sectors of the ESD field. If not, some might suspect there may be a false or unwarranted sense of control, or they may doubt the validity or veracity of interventions in the system. More broadly, we note that as indicators are proxy measures, they are usually not specific or authoritative enough to directly inform specific solutions in terms of policy or administrative action. Thus, indicators might be better positioned in public debate as a starting point, to enrich public discourse, catalyse new ideas, press a claim on the public agenda and its resources, and shape ideas and values, particularly if used in conjunction with other strategies for evaluation.

3. **To secure the acceptance and adoption of new accounting systems like indicator sets, incentives must be considered.** Financial need and efficiency gains are possibilities to consider here; but also whether the set will be voluntary or not, and at what cost and benefit to participants, the government, the evaluator, the teacher and learner. International policy like Agenda 21 can make indicator sets a necessity not an option. Timely and reliable data can demonstrably assist planning. ESD can be promoted as a lens for the wider world of education to be judged. Trickle down effects should be identified and promoted, e.g. learning gains, SD outcomes.

4. **Continuous review and updating of progress should monitor whether organisation goal displacement or conceptual distortion are introduced into work related to ESD because of the use of indicator sets.** Past experience has shown that with indicators, concentration can end up on the trivial because it is measurable, and neglect the meaningful because it is complicated. Relatedly, indicators become ends or goals in themselves. Review should also address the contexts for the indicators in accounting for the reasons for performance of the system, and thus, credence should be given to a portfolio of evaluation and measurement options, such as less formalised knowledge, and case studies and professional expertise.

Policy recommendations, therefore, are:

A. **To use existing monitoring of formal education contexts to track developments in ESD, reporting these to all stakeholders annually, through a reflective overview.**

B. **To encourage NGOs and others involved in non-formal ESD contexts to report developments on an annual basis through reflective commentaries.**

C. **To encourage communities and institutions to agree and adopt their own ESD indicators in terms that make contextual and conceptual sense to them, reporting these in appropriate ways from time to time, and holding such indicators permanently under review.**

D. **To commission biennial research studies with the purpose of benchmarking ESD in formal, informal and non-formal sectors.**

E. **To bring stakeholders together on a biennial basis to share developments and consolidate learning.**

F. **To ensure that the ESD indicators have a clear conceptual linkage to SD and education, and, to remember that no matter how positive an ESD indicator may be, this can be no guarantee that a contribution to SD is actually being made.**
Introduction

Report overview

We start the main report with a background section that briefly sketches the recent confluence in the key themes of this document, namely: indicators, SD, and education. We then focus on the contributions and discussions at a series of presentations and workshops during a seminar on indicators for ESD, held in Bath (June, 2006). There, we identify and discuss: (a) key issues in indicator methodology and the application of indicators to the field of ESD; (b) existing and emerging critiques of indicators in social policy settings; and (c) a range of ESD indicator projects underway in Europe. The report ends with our reflections on the perspectives, challenges and progress, given these debates and recent activities on ESD indicators.

Before then, in this preparatory section, we set out our views on indicators to sensitise the reader to some of the key issues discussed in the main section and conclusion to the report.

A. What are ESD indicators?

There is no single way of defining indicators; as Macgillivray and Zadek (1995:3) note, “definitions for the term indicator have proliferated almost as quickly as their applications”.

Yet broadly speaking, an indicator, from the Latin verb ‘indicare’, is a device that points to a certain state or condition of a system, typically characterised by complexity and uncertainty. Given this, in essence, an indicator is a proxy measure (i.e. not a direct one) that aims to simplify, measure, and communicate complex trends and events to a broad audience. It relies on the availability of understandable and reliable data, and should connect to the interests and concerns of those affected by the indicator and the system to which it refers.

Indicators are commonly used in economics, social policy and health settings. Through a series of initiatives and sets of indicators that have been developed during the mid to late 20th century, their use and diffusion (and critique) have extended to other sectors, including measurement and evaluation of education, the environment, and sustainability. To illustrate the range of possibilities and to challenge a common conception of indicators, in commenting on a range of indicator sets developed during the late 20th century, van Ackeren and Hovestadt (2003) note that ‘indicators’ are often based on statistical data but not all statistical data are automatically indicators, i.e. fulfil the key premise of being indicative. Statistical data are indicative when they not only indicate the actual state of a system or part of a system, but also allow one to go beyond a purely descriptive level. Thus, insofar as any data can be interpreted as relating to a reference point for a model of the system under investigation, and the quanta or value of the measure can be read to imply some kind of warranted action in response to the indicator (e.g. changing or maintaining a course of action), they are indicative.

Oakes (1989) argues that an indicator system must have its own logic and ethic, it should be based on a model and on values that are explicit, and the relative importance of the various indicators should be stressed and transparent (e.g. in the notion of headline indicators, or core and non-core indicators). This implies that to qualify as suitable, a proposed indicator has to be application correlated, i.e. its role must be clear in relation to the broader picture and rationale...
for its selection and use, particularly in terms of giving specific value to undertakings in data collection. This value is usually some socially-determined and agreed standard or reference point in relation to a model of a system. Given the value is likely to change and be interpreted differently by diverse members of the community, the absence of ongoing review can invalidate an indicator. Thus, indicators should not be regarded as an objective measurement of results, nor are they value-free, neutral or purely technical considerations; they are theory-laden in relation to what it considered important, legitimate and reasonable to focus on for a model and system in relation to the chosen indicators.

On this point, we also note that the value sought for the indicator information is often defined in terms of the end in mind regarding various presences and absences in a system: to aid awareness-raising, decision-making, evaluation, resource management, and accountability; to promote political acceptance, capacity building, orientational knowledge, funding, progress towards targets. Similar to this line of argument, Sauvageot and Bella (2003:13) \[1\] argue that for indicators about education, “…an indicator is not basic information; it is a body of information that has been elaborated so that an educational phenomenon can be studied.” Thus for them the difference is clear: “as it is the difference in analytical potential” (ibid.). Such action-related indication can be provided through a wide variety of general functions attributed to indicators, inter alia:

- to simplify or distill complex information about the features of the system
- to monitor or account for the performance of systems in ongoing and systematic ways against desired or reasoned conditions, reference points or expectations (e.g. for processes and components, to chart and evaluate the effectiveness of resources spent on a policy, programme or innovation)
- to measure the state, direction and rate of change (e.g. ‘progress’) and compare it over time and context (e.g. benchmarking) with reference to its links to a model, yardstick, or outcomes
- to act as a ‘warning’ system to point to unfavourable developments or system states
- to raise awareness and communicate information and trends to decision-makers, stakeholders and the public-at-large, e.g. about strengths and weaknesses of current practice or policy
- to stabilise processes (particularly implementation) through, for example, generating profiles of data and target setting
- to aid accountability, governance, decision-making, dialogue, planning, and reform, and address stakeholder interests about the present and future state of the system under consideration.

As Eide (1989:87) states in relation to better indicators being more modestly tied to what is measurable, observable and demonstrable rather than inferable about a system in providing indicator-based decisions:

“In my vocabulary, indicators are just information assumed to be relevant to some individuals, as a basis for decisions, or simply for increased understanding.”

Typical types of ESD indicator \[2\] found in current initiatives include:

- **Status Indicators**: assessing those variables that highlight the position or standing of ESD in a country, e.g.
  - baseline indicators assessing policies, programmes, actions, and/or public opinions; processes and social learning; results in the form of capacity building, infrastructure, and resourcing; and
  - performance indicators assessing change and/or performance in relation to baseline measurements, over time and context, e.g. to compare regions.

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• **Communication Indicators:** (also referred to as communicative indicators) assessing those core variables in a way that is accessible or facilitates communication to stakeholders and the general public in terms of key ESD policy priorities, e.g.
  - small numbers of *headline* indicators assessing, for example, the status, facilitation or results of sustainable schools initiatives, capacity building strategies, environmental education and awareness campaigns; and
  - *aggregate* indicators, weighting the relative importance of indicators (e.g. baseline and performance indicators) and simplifying their measurements into a smaller set of indices.

• **Facilitative Indicators:** assessing those variables that assist, support or encourage engagement with ESD, e.g.
  - *context* indicators assessing the existence and/or quality of ESD support systems, such as national governance mechanisms and institutional support systems, alongside public support, opinions and awareness regarding SD and ESD (e.g. the work of and public participation in NGOs and other agencies and civil society institutions);
  - *process* indicators that identify the existence and/or quality of ESD processes and activities, such as planning, development, implementation and monitoring and assessment of ESD policies, programmes and activities, e.g. participation levels, teacher training, research, evaluation, stakeholder involvement in decision making, ESD action plan development processes; and
  - *learning* indicators, assessing the quality of a nation’s engagement with ESD, in terms of the levels of capacity building and social learning that accrue from ESD processes, focusing on, for example, motivation, empowerment, futures thinking, critical thinking, awareness and understanding, and systemic thinking in relation to SD.

• **Result Indicators:** assessing those variables relating to long-term achievements arising from ESD, e.g.
  - *output* indicators assessing outputs such as tools and learning resources, support materials;
  - *outcome* indicators, assessing ESD outcomes related to changes or improvements and achievements that result from ESD efforts, such as attainment and achievements in learning about SD, increases in SD awareness, and increased competencies relating to disciplines and sectors; and
  - *impact* indicators, assessing ESD impacts that result from ESD efforts, showing the degree of genuine progress related to organisational, societal and learner-oriented change for SD, such as the level and change in the ecological footprint of the nation state, gender equality, human rights, etc. 13

**B. Why use ESD indicators?**

In relation to the functions and arguments noted above then, indicators are principally used to summarise complex information of value to the observer. They are best used in concert with other measures and evaluations of a system’s performance, e.g. with case studies, direct measures, and ongoing theoretical analysis. As proxies or substitute measures, indicators point to an issue or a condition where direct measurement may be impossible, difficult to achieve, or not warranted. Indicators are intended to enable monitoring of progress, identification of areas of importance (goals and priorities), and may suggest a focus for a course of action. Again, it should be stressed that using indicators alone is not good practice for policy-making or evaluation – other considerations and democratic processes should be available and in place to aid decision-making.

In relation to education, SD and ESD, indicators are now commonly expected to promote learning as well as guide planning, processes, policies and interventions within diverse settings for teaching and learning.

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Underpinning our comments and this analysis on why they are used, is the assumption that the various models for implementing ESD may focus attention on one or a combination of the following areas:

(a) conformance with external goals or specifications;
(b) quality resources and inputs;
(c) smooth internal processes and fruitful learning experiences;
(d) the satisfaction of powerful constituencies;
(e) achievement of ESD’s legitimate position and reputation;
(f) absence of problems and troubles in implementation; or
(g) adaptation to situational requirements and internal barriers, and continuous improvement.

ESD indicators differ accordingly for these foci; for instance, in relation to the aforementioned list, we might use corresponding indicators to focus attention on:

(a) measurements against standards, objectives or specifications;
(b) the resources procured for ESD functioning, such as the quality of facilities and financial support;
(c) leadership, participation, interaction, activities and experiences;
(d) the satisfaction of authorities, administrators and other stakeholders;
(e) public relations, marketing, public image, reputation, status in the community and evidence of accountability;
(f) absence of conflicts, dysfunctions, difficulties, defects, weaknesses and troubles; and
(g) awareness of external needs and changes, internal process monitoring, programme evaluation, development planning, and capacity building.

However, for the ESD implementation model and indicator set to correlate well and demonstrate fitness for purpose, their particular conditions must also be acknowledged and addressed; thus, correspondingly, they may require:

(a) educational and institutional goals and specifications that are clear, consensual, time-bound, and measurable, with resources that are sufficient to achieve the goals and conform to the specifications;
(b) a clear relationship between inputs and outputs, when quality resources for ESD are scare;
(c) a clear relationship between processes and educational outcomes;
(d) demands between the constituencies that are compatible and which cannot be ignored;
(e) assessment of the case for pursuing the survival of ESD in a competitive or demanding educational and policy environment must be addressed;
(f) strategies for improvement in the absence of consensus about quality criteria; and
(g) that institutional and circumstantial change cannot be ignored, particularly when ESD is new or changing.

Depending on the model and conditions, the focus of ESD strategies and indicators will not necessarily include all aspects of the inputs, processes and outcomes of ESD that a wider indicator set may present, or other contexts or scenarios demand.

Clear challenges for developing ESD indicators are how to combine or aggregate measures across models, purposes and conditions; what will be represented or included in the reporting; and what actions can be mandated given the results, over time, given the key challenges and issues in using ESD indicators outlined below.
C. What are the key challenges in using ESD indicators?

Given the contributions to the seminar and workshops, the arguments above, and the wider literature and experience in this area, we identify the following key challenges:

I. Recognising that indicators are proxy measures

We are relatively familiar with everyday examples of indicators: in weather reports, retail price indices (on inflation), and the data displayed on motor vehicle dashboards. They are also used in GDP calculations, in financial markets such as the FTSE 100 Index, and in business scenarios such as the balanced scorecard methodology. Important to each example is that we appreciate what the indicator [or indicator set] is supposed to refer to [a model of reality], what it is supposed to indicate [its desired function or role], the relative complexity and predictability of the system represented in that model, and, consequently, the strengths and limitations of the indicators. The latter particularly relate to matters of appreciating what indicators can and cannot indicate, how indicators are aggregated or components weighted depending on their relative importance, and the confidence that may be placed in the indicators.  

All this flows from the fact that indicators are a proxy rather than a direct measure, and thus can only ever provide a simplified understanding of a complex system and how it is working. Thus, we need to be aware that sometimes an indicator may fail as a metric that represents a system or its attributes or functioning. Or it may be that it no longer appropriately represents this, owing to their dynamics and evolution, their relative intangibility or inscrutability, or interventions within the system (politically, economically, environmentally, and so forth). We must also consider that an observer may fail to interpret the indicator appropriately, as in the commonplace scenario when data about a weather system are interpreted incorrectly and become the basis for a faulty forecast, a situation that may in fact become apparent before, during, or – indeed – after the event. A key challenge then for ESD indicators is to ensure a shared basis for, and expertise and capacity in, interpreting indicators.

Oakes (1989)  

“Ideally, a system of indicators measures distinct components of the system of interest, but also provides information about how individual components work together to produce the overall effect. In other words the whole of the information to be gained from a system of indicators is greater than the sum of the parts.”

Furthermore, in contrast to only considering systems as functioning linearly, e.g. input-output models, Capra (1982:269) suggests an holistic perspective is also kept in mind, given that:

“When a system breaks down, the breakdown is usually caused by multiple factors that may amplify each other through interdependent feedback loops.”

Here then, we should note that the effectiveness of an indicator set relies on the accuracy, openness, quality and regular review of the modelling, system understandings, and operationalisation of the proxy measures, particularly when direct measurement is not available or possible.

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2. **Indicators are used and interpreted differently for a variety of reasons**

We can expect a good indicator to alert us to a problem before it gets too "bad" and help us to recognise: (a) what needs to be done to fix it; (b) what decisions or directions can be taken to address the issue; and / or (c) what needs to be done to achieve a desired state of affairs. As Gallopin (1997:15) 17 argues:

“Desirable indicators are variables that summarize or otherwise simplify relevant information, make visible or perceptible phenomena of interest, and quantify, measure, and communicate relevant information.”

Yet we should also be clear that we have to always proceed with the fact that indicators are not the reality they measure. Furthermore, as noted above, in practice indicators may be either inaccurate or overridden (e.g. owing to shortcomings in the modelling or to political priorities or exigencies), and, how indicators are interpreted by the user or audience are separate issues to others typical of debate in this area, for example, confusing their position as a means with that of an end, or not appreciating the strengths and weaknesses of different types of indicators (e.g. qualitative or quantitative), or how they are linked or aligned with wider matters.

In relation to SD, education, or ESD, based on the preceding assumptions and arguments, a set of indicators fit for purpose should be able to show where we start from, where we are going, how we think we are going to get there, and how far we are from where we want to be. The indicators are not an end in themselves though, and should not be the sole basis for judgement. This assumption is implicit in further considerations and challenges, as follows.

3. **Attentiveness to the degree of precision and transparency in the indicators**

Assessments of student knowledge and skills such as the OECD’s Programme for International Student Assessment (PISA) 18 produce data sets that require interpretation. Typical questions include whether the PISA measures of reading, mathematics, and scientific literacy give us confidence in the effectiveness and impact of current educational policy and practice. We must also consider under what conditions and whether the measures are (and remain) appropriate, valid and reliable, as well as the interpretive frameworks and decision-making systems that work with the indicator set.

Thus, difficulties may emerge with indicators where what the indicator refers to is vague or contested (as is the case with SD, which has many definitions and interpretations), or when what the indicator is supposed to measure is complex and non-linear (as is the case with education, e.g. teaching inputs do not always lead to direct learning outputs, i.e. the ‘black box’ scenario, and unintended effects). Difficulties may also appear when goals or expectations relating to indicators conflict, e.g. when setting or hitting targets and compliance with them dominates reflection on and learning about practice in ESD, or vice versa.

As stated earlier, precision and transparency in relation to the indicators and what they refer to are important expectations to be met for an indicator set, particularly if complexities are to be clarified, and progress made in debate about indicators and the field to which they refer 19. Clear, measurable and attainable goals and priorities should be reflected in the indicators.

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17 Gallopin, op cit.
18 Available online at: http://www.pisa.oecd.org/
The choice and use of ESD indicators needs careful consideration then because they are:

- are frequently developed out of conflicting values, assumptions and worldviews about:
  - measurement (e.g. what to measure, how to measure, what is worth measuring, and the quality and availability of measurements for ESD) and
  - purposes (e.g. the overarching concepts involved, such as: whether being able to reconcile a divergence of views on SD and education is likely and with what effects, benefits or shortcomings; that both SD and education can be interpreted and adapted nationally and regionally; that there are costs and benefits to both expert and grassroots participation in the process of indicator development and use; and, whether indicators are intended for comparative purposes primarily, or stock-taking, action planning or intervention, instead or as well);
- remain based to some extent on uncertain and imperfect models of reality (that is, revision is always possible, as is transformation in our understanding of how a system is conceived, functions or changes); and
- are indexed to systems or realities which are dynamic and evolve over time. They may also reach or exceed particular thresholds or targets (economically, environmentally, developmentally, etc.), some of which may be provisional and contingent on political processes and events (e.g. national and international policy statements).

Another way of putting this is, as the systems that they refer to are dynamic, so must indicators be, i.e. they cannot be a static set tied to one understanding of system for one particular time and context. Indeed, the choices in and about indicator sets must always take place in the face of uncertainty, ambiguity and multiple expectations and worldviews about indicators and ESD and the realities to which they refer. Hence there is a strong case for regular review and adjustment of any serviceable set of ESD indicators: in terms of its ongoing coherence with the system it is supposed to refer to, and as an information system itself (e.g. the specificity, style, purpose, focus and context of the indicators) 20.

Recognition of the fact that this action requires considerable work, resources and expertise to be accomplished well as previous waves of indicator initiatives have revealed (see Background), also serves to identify some of the key obstacles for indicator initiatives in achieving their goals, meeting expectations, and living up to the promise of indicator systems.

Furthermore, it must also be borne in mind that no single indicator can be seen as indicative of quality in its own right. Rather it is the combination of quality measures that form the basis for interpreting the quality of a system of / for ESD 21. Hence as cultural contexts and ESD elements vary dynamically, differences and similarities between models and sets of indicators should also be subject to ongoing comparison and evaluation.

4. Pitfalls in the process of choosing and using indicators

In general, pitfalls include: overaggregation; measuring what is measurable rather than what is important (e.g. reflecting the availability of data); dependence on a false model; deliberate falsification; diverting attention from direct experience; overconfidence; incompleteness 22; the illusion of accuracy, e.g. in capturing or representing states or intervening dynamic processes; and the temptation to decontextualise the indicator and its implications.

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Other pitfalls include a lack of broader and ongoing analysis regarding educational concepts and priorities, the socio-political situation, cultural and stakeholder needs, developmental goals and targets, civil and administrative capacity, political will, and current monitoring and assessment strategies and activities (which may have already used indicators) for education and SD, e.g. acknowledging tensions between demands to use indicators for quality enhancement and quality assurance within ESD.

5. **Conceptual issues that need to be addressed in the field of ESD**

   These include:

   a. **the relation between indicators for ESD, SD and education**
      The process of indicatorisation is not simple and straightforward, given our experience of indicators in other fields. Key questions for any indicator set include: are the indicator measures to be stand-alone or integrated? Do they use available data or require new data? Are they qualitative (descriptive, observational or ratings) or quantitative (absolute figures or ratios), and are there preferences for one type of data over the other (e.g. addressing the relative status of measurable data over observational data in evaluations)? Can or should they be aggregated or synergistic? Conversely, can any one indicator be extracted or isolated from a broader set of indicators?

   b. **the relation between indicators for ESD, SD and education, and others**
      As with (a), relationships between indicators may offer evidence of joined-up policy thinking, and alignment that takes account of social relevance or cultural appropriateness. But there is also the need to recognise that other factors (diversity, governance, gender, language, resources, technology, communities, cultures, family, values, ownership, communication, civil capacity, employment, status, etc.) influence people's learning, behaviour and choices about SD, and that it is often difficult to distinguish and measure the effects of education alone on, for example, the goal of enhancing the sustainability of lifestyles and livelihoods.

   c. **the wider purpose of indicators**
      It might be that indicators are usually expected to facilitate cross-case comparison and analysis of performance through benchmarking in the initial stages, but we might also ask, should their use for ESD also facilitate mutual exchange and learning about different approaches in national or regional contexts at later stages – examples of the wider expectations of working with indicators, and links with other evaluation strategies, over the longer term?

   d. **how the indicators map onto the subject of the evaluation**
      A key question here is how do ESD indicators (and results) inform local, national and regional ESD strategies? Is causality and effect a necessary prerequisite for the choice and use of indicators in relation to the underlying model, or is ambiguity and uncertainty tolerable, or even to be preferred? Also, as above, is there a phasing of indicator sets and measurements (e.g. baseline data and indicators in an initial phase, followed by subsequent phases, with perhaps revision or refocusing of the indicator set over time), and how is this aligned to the demographics of a population, e.g. in terms of lifelong learning (affected by such factors as whether a country has an aging population; the proportions of urban and rural populations; cultural, developmental or environmental diversity, targets and challenges; war/conflict; colonial experiences or effects; the degree of equal access to quality educational institutions and opportunities, etc.)?
e. **the scope of the indicators**
   The specification of key and sub-domains to indicators and the concepts and models to which they refer is crucial if we are to clarify the use and purpose during the process of creating workable indicators. Some constituencies may expect ESD indicators to address, for example, how 'indigenous knowledge' is conserved, used and promoted in ESD, while others may expect the educational organisation to model good practice in ESD in terms of infrastructure (e.g. buildings and environment, management, procurement). Yet others may want to suggest that the effectiveness of ESD should be regarded as an indicator of the effectiveness of the SD process at the local and/or national level. Decisions clearly need to be made, given budgetary and resource limitations, but with what costs and benefits?

f. **the incentives, pressures and ownership by stakeholders of indicators**
   A key issue is whether indicators must always be the concern and responsibility of expert or high-level or high-status groups. Might or how should they also be in some sense owned by communities and organisations, e.g. to foster participation, momentum and progress in the shaping, implementation and development of ESD, or to draw in ESD donors or champions? Indeed, might not communities and organisations take the responsibility to determine, monitor and report their own locally-grounded, context-specific and bottom-up ESD indicators? And in such cases, how might these then become part of the formal reporting processes to / of national bodies like government? Or, is such a course of action at risk of abrogating national or ministerial responsibility, or to limit or deny the role of government political pressures and incentives? For example, we should also consider whether and how indicators are being used consistently for monitoring, learning or planning across education and environment ministries, and what status they have there in decision-making and policy processes.

6. **Practical issues that need to be addressed in the field of ESD**

   These include addressing:

   a. **the overall number of indicators**
      The value, comprehensiveness and rigour of the indicator set may be adversely affected by a preference for realistic, user-friendly, workable, feasible and effective reporting processes. This may be a consequence of a process of simplification, or spring from tailoring or translating the indicators for wider use in a broad variety of contexts (as in creating shared indicators for formal, informal and non-formal education in different countries and historical settings). Alignment with context and linkage between ESD indicators and reporting mechanisms within a broader framework of global (and local) initiatives are key issues here, e.g. Millennium Development Goals, Education for All, UN Literacy Decade, Agenda 21, and initiatives associated with the Kyoto Protocol and Marrakech process. Relatedly, how many indicators are required for ESD – enough to allow something sensible to be said about the educational system, for example, but not too many so that they confuse things?

   b. **the mix of the types of indicators**
      Key issues here relate to, the mix of quantitative and qualitative indicators; required or optional indicators; measures of ‘implementation’ and the ‘effectiveness of implementation’; and, established or innovative indicators. Questions here also relate to whether the complexity and reach of ESD is genuinely assessed, and the commitment, partners and financial support to do so; alongside how relevant, easy to understand, representative, reliable, and obtainable each data set is, against realistic costs.
c. **the type, focus, time frame and reporting of each indicator**

Questions include, are the indicators (either separately or together) about: input or output, impact or outcome, the short or longer term; are there locally versus internationally agreed formats for the indicators (e.g. to address difficulties in gathering data owing to decentralised education systems (as in Germany), lack of data for non-formal and informal learning, etc.); and, is the ‘quantitisation’ of qualitative data, or the ‘qualitisation’ of quantitative data involved in the scoring of measurements, or in the aggregation of scales and types?

d. **the incentives for using the set and compiling the data**

As with the ownership of indicators, and other questions above, key issues include which agencies (e.g. governmental, non-governmental) will drive and manage the process and reporting of ESD indicators and for what reasons; how public will the process and data be given the limited personal and financial resources available for ESD in many countries (e.g. relating to the means and sources of verification); and will governments, for example, enrich or expand a transnational, national or local indicator set?

e. **the consistency, validation and the avoidance of duplication in data**

Questions include: does the indicator set fit well with existing needs, data sets/repositories and methods (e.g. public surveys, Eurobarometers, inspection, case studies, ad-hoc research), data reporting and usage, and represent joined-up thinking?

To summarise, key questions to ask of an ESD indicator initiative are:

1. How are indicators understood and operationalised in this initiative?
2. What specific purposes are indicators being used for?
3. How is it that each indicator acts a proxy measure, as opposed to a direct measure, and in relation to what is not measurable?
4. What guidance is offered on how the indicators are to be interpreted, i.e. in relation to which model or system?
5. How does the indicator set address change in the system or its dynamics?
6. Are the pitfalls in the selection and use of the indicator set transparent and explicit?
7. Does the indicator set relate, if at all, to other indicators in related areas?
8. What are the incentives for developing, using and acting upon the indicator set and its findings?
9. Who are the stakeholders in the process of developing, using and acting upon the indicators?
10. What are the alternatives to the indicator set?

The next section of the report moves away from our largely abstract considerations and issues to consider concrete developments and examples in the field of indicators for education, SD and ESD.
Setting the scene

“The search for indicators is evolutionary. The necessary process is one of learning.”

— Donella Meadows

Indicators in general

Indicators are commonly associated with the field of macro-economics. Here, it is recognised that complex economic systems are difficult or impossible to measure directly, and there is little to be gained by taking a short term perspective on a process, i.e. a series of proxy measures over time will reveal something about the performance of the system under investigation.

Economic indicators came to prominence with what have been called the “headline indicators of economics” (Macgillivray & Zadek, 1995:3) i.e. ‘Gross Domestic Product’ (GDP). The GDP of a country measures the market value of all final goods and services that have been produced in country within a certain time period. While other economic indicators have proliferated ever since (e.g. the World Economic Forum’s World Competitiveness Report), GDP has remained the headline indicator of economic progress and consequently the prime measure of a system’s economic health. However, as Keynesian and neo-Keynesian models of economy have been challenged and/or replaced in highly industrialised nations by interests in those related to a knowledge society, indicators have changed too and have come to be increasingly important measures of the development of a knowledge economy.

Attempting to replicate the success of indicators in macro-economics, and to investigate how social processes linked with a country’s economic health and productivity, indicators were introduced into social policy in the OECD states during the 1970s, under the aegis of the ‘social indicator movement’. At the time it was thought that the benefit of indicatorising social policy-making could be established by deliberately tying measures to those social areas that needed to be addressed politically, through the collection of statistical data about those phenomena, i.e. there was an explicit attempt to shift from an enlightenment to an engineering role for evaluations.

The main argument for international comparisons of society and social outcomes was that they can contribute to better understandings of the relative influence of a number of significant variables in social processes and outcomes. The movement had some relevance till the mid-eighties and is still recognisable in such projects as the United Nations Development Programme’s (UNDP) Human Development Index (HDI), the social equivalent to the GDP (see below), although it never had the same recognition and use as its economic counterparts. In education, the focus tended to be on descriptive statistical time series on enrolment, attainment, retention and completion rates.

Key issues for the social field at that time were the strength of existing informational systems in being able to make data available and to track trends, and technical challenges in developing and interpreting a reliable set of indicators which took account of the differences in the composition and structure of society across countries. These issues became the focus of attention during the seventies and eighties, and were subject to much debate about how well they had been resolved both theoretically and practically in the various uses to which indicators were then being put, particularly by governmental, quasi-governmental and non-governmental organisations (NGOs) in political debate about the social field, including the inputs, outputs, quality, and outcomes of the educational system.

12 This is particular influential at the European Union level, owing to the Bologna Process.
13 Bryk & Hermanson, op cit.
Changes in expectations and modes of governance: indicators for education

A new wave of social policy indicators emerged in European and Anglophone countries (e.g. the UK, USA, and Australia) in the eighties and nineties in the context of broad structural changes related to new forms of public governance. Burke and Hayward (2001:2) 27, in commenting on these developments, argue:

“By new managerialism we mean new forms of public sector governance modelled on private sector principles in which emphasis is given to the establishment of contracts as a means of delivering outputs. Performance indicators are crucial to this system, for they form the basis of contractual relationships as well as the benchmark against which performance is to be assessed. In many ways the success or otherwise of the new managerialism is dependent upon how well performance indicators work as a policy tool.”

The quotation signals something of the basic assumptions underpinning this shift in governance whose roots can be traced to the impact of neo-liberal ideas about weakening state influence on the public sector combined with “private sector management styles” (Peters et al, 2000:109) 28 and “a decentralization away from the centre to the individual institution … coupled with new accountability and funding structures” (p.110). This ‘new accountability’ promotes comparison of performance, monitoring and data collection, and often leads to a change from input to output driven indicator systems, by adding output and context measures to the more traditional measurements of inputs and resources. In the educational field, accountability is recognised by a focus on measuring the achievement of single schools and/or the educational system as a whole (through indicators or educational standards), particularly in terms of reaching a priori normative performance targets, and then using findings diagnostically via feedback loops to manipulate input factors and process characteristics.

In this scenario, the funding of an institution or evaluations of educational policy-making can be made subject to and controlled by how well schools and/or the educational system do in reaching performance targets. Such neo-liberal underpinnings can also be identified within the wider discourse on indicators for education policy, where their main function is as tools for measuring and benchmarking performance and quality of educational systems, and offering a means to improve the functioning of the system, by examining the direct and indirect, unidirectional and reciprocal, and causal relationships between key variables like inputs and resources, processes, and outcomes. 29 As Bryk and Hermanson (1993:452) 30 note:

“In sum, indicators are promoted as efficacious instruments with which to monitor the educational system, evaluate its programs, diagnose its troubles, guide policy formulation, and hold school personnel accountable for the results—an impressive array of tasks.”

Arguably, autonomy is a major casualty of these changes, but this has not always been, nor does it have to be the case. The use of indicators in education has a longer tradition and broader range of uses, dating back to the late 1950s, with the ‘International Association for the Evaluation of Educational Achievement’ (IEA). This was the first forum at an international level that attempted to measure and compare the outcomes of the educational systems of the industrial states. To date, besides the ‘Organization for Economic Co-operation and Development’ (OECD), the IEA is

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30 Bryk & Hermanson, op cit. p.452.
one of the leading agencies for conducting international large-scale assessments, such as TIMSS (‘Third International Mathematics and Science Study’). The increasing interest in the outcomes of different educational systems can be seen in relation to the models of economic development at that time that sought to correlate education and economic growth; here education is primarily seen as the key for the development of ‘human resources’ (the work of the RAND Corporation is also notable here, and human capital theory; see Oakes, 1989).

OECD has taken a lead role in the promotion of indicators as tools for performance measurement in education at the international level since the 1970s, developing then a first set of education indicators about inputs and resources. A next, more systematic step to indicator development was the establishment of OECD’s INES-project (education indicators project), which led to the annual publication of ‘Education at a glance’ (since 1992; a comparative evaluation of the state of the educational systems of the industrial countries and most prominently, for the public domain, the PISA studies (Programme for International Student Assessment).

Bryk and Hermanson (1993) caution though that there is a lack of debate regarding the fundamental premises with which education indicator models work, particularly about the nature of schools as organisations, their aims and central activities, the exercise of control over these institutions and their processes, and how indicator-based information can productively enter this domain. Given these shortcomings, they argue that democratic debate and discourse about the scope and potential of indicators and the means and ends of education in relation to different sets of cultural values and structures is necessary, and that where it is limited or does not occur, this can result in the misuse and abuse of indicators, e.g. in promoting a simplistic view of schooling (e.g. its core and peripheral activities), evaluation, and how new information and policy-making may influence future activity in the educational system.

**The emergence of indicators for SD**

The use of environmental indicators has also gained attention, as a means to ‘measure environmental progress’, e.g. in the Millennium Ecosystem Assessment (MA) produced by UNEP-WCMC and UNEP’s Division of Early Warning and Assessment (DEWA). These indicators aim to measure either the state of the environment or the impact of human pressures on the environment, such as atmospheric emissions of pollutants, and echoing the new forms of public governance, have emerged in relation to serving the needs of the proliferation of environmental policies (OECD, 2003:4) 31:

> “Initially the demand for environmental information was closely related to the definition and implementation of environmental policies and their effects on the state of the environment.”

A prominent example of the development and use of indicators in this respect is the OECD’s environmental indicators. Like their education indicators, these are regularly published and used in OECD work and particularly in environmental performance reviews. In this case, the indicators are based on a pressure-state-response model (PSR). The ‘PSR’ is a ‘cause-effects’ model assuming that human activities exert pressures on the environment and affect its quality and the quantity of natural resources, referred to as the ‘state’. In this model it is further assumed that “society responds to these changes through environmental, general economic and sectoral policies and through changes in awareness and behaviour (‘societal response’)” (OECD, 2003:21). However, as Pintér et al. (2005) 32 highlight regarding the limitations of this model, it is only applicable as long as causal linkages can be established, and therefore it runs the risk of oversimplification of inter-

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32 Pintér, Hardi & Bartelmus, op cit.
linkage between issues, a situation that Bryk and Hermanson (1993) claim has happened with some indicator sets in education.

This oversimplification is particularly important for the field of SD, where since the early nineties, environmental indicators are often substituted or accompanied by and mixed with SD indicators (Pintér et al., 2005:5), and strongly associated with governance purposes:

“Indicators have always been an integral part of governance. However, the sustainable development indicator “movement” did not take place until the early 1990s when SD started to become an integral consideration in policy-making.”

With SD being a broad based and highly contested concept, false models, lack of established causal linkages, and oversimplification, are all substantial threats to the validity of indicators in this field. Yet despite these caveats, it is clear that the last two decades have seen SD grow in influence in policy-making at national, European and international levels. While there is no single agreed concept of SD 33, many interpretations of the concept challenge traditional views on the process and direction of wealth generation and social development: a reorientation towards sustainable growth and consumption is one focal point of some SD initiatives; others make environmental or social justice, the sustainability of lifestyles, or, cultural or civic renewal, their priority.

Current interest in SD indicators reflects growing pressure to reconcile developmental priorities, practices and models with environmental resources, challenges and constraints. Herman Daly’s triangle (Figure 1) is a prime example 34 of but one of many attempts to both picture and model the relationship between the human economy and the earth. The Daly Triangle aims to capture and represent that which supports and sustains all life and economic transactions, the processes and capacity within which it takes place, and the ends or purposes to which these are put. Equally, the Triangle serves to illustrate one model from which indicators for measuring SD trends over time and context might be derived, particularly for governance purposes. In this case, indicators are targeted at a measurable quality or characteristic of an aspect of SD at the various levels of the triangle, or perhaps more importantly here, at the connections and relationships between them.

Other well-known SD-related indicator approaches are ecological footprinting 35 developed by the environmentalists, Matthias Wackernagel and William Rees (since the 1990s), and the UN’s Human Development Index, developed by the economist Mahbub ul Haq, in 1990 36. The former example is an aggregated measure. It attempts to operationalise a set of indicators based on a sustainability model that focuses on critical natural capital and natural capital stocks, translating this into the land required to maintain a person’s, city’s, industry’s or nation’s activities, and whether this exceeds a ‘one earth’ benchmark. The latter is also an aggregate index. It uses a range of social indicators focusing on education, public safety, health and governance (amongst other themes) to show whether quality of life is or isn’t sustainable in terms of the community’s human, social and built capital. The three basic dimensions captured in the Human Development Index, as used by the UN Development Programme, are “a long and healthy life, knowledge, and a decent standard of living”. Its inverse is the Human Poverty Index, also used by the UN, which is a composite index measuring deprivations in those three basic dimensions [see http://hdr.undp.org] (examples of key terms and initiatives are illustrated in Figures 2 and 3).

In each example, there is a strongly normative element to the indicator set: indicators are being developed to help inform or promote particular kinds of societal behaviours; in effect, some behaviours are to be celebrated, rewarded and encouraged based on the data, others punished, reduced or avoided, in relation to the model of SD. Moreover, we note that in relation to Daly’s work, Meadows (1998:x) has argued:

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Figure 1. The Daly Triangle. Source: Meadows, 1998:42. 37

37 Meadows, op cit.
**Figure 2. Types of Indicator**

**Baseline indicators:** help to identify the starting points for change; and provide a reference point in identifying realistic impact indicators;

**Process (performance) indicators:** show whether planned activities are actually carried out and carried out effectively;

**Impact indicators:** assess progress towards objectives:
- short term impacts on individual changes in understanding, values and attitudes;
- longer-term impacts on practice at different levels, such as changes in classroom practice, learning methodologies, schemes of work and curriculum contents; *organisational change* in terms of culture, policy and partnerships; *national change* in terms of changes of accreditation systems, education plans and policies. Long term influence of programmes is difficult to assess because many factors beyond the programme can influence such changes

**Learning outcomes:** form of qualitative indicator, enable us to measure anticipated (planned) learning and unanticipated learning, to improve performance

To determine indicators and their means of verification ask the questions:
- What evidence would make us feel we are making progress?
- How can we collect this evidence?

It is not possible to make ‘one simple measure of effectiveness, or one set of indicators’, for each project has its own goals (that differ between different organizational levels, e.g.: project, programme and strategic), particular context, and stage of development.

Source: Sollart, 2005, para. 4.2. 38

**State indicators** describe the state of a variable. The atmospheric concentration of greenhouse gases, for instance, is a state indicator of climate change. The dissolved oxygen in water is a state indicator of human health since it indicates the quality of water, which itself affects human health.

**Control (pressure) indicators** gauge a process that does influence a state indicator. Thus, the emission of CO2 affects the atmospheric concentration of greenhouse gases. The generation of industrial or other types of wastes is another example of pressure indicator.

**Response indicators** gauge required progress in the responses of governments. The number of protected areas as a percentage of threatened areas is a response indicator linked to the issue of biodiversity.

Source: Simon, 2003, p.2. 39

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38 Sollart, op cit.
Figure 3. Characteristics of ideal indicators

Indicators should be:

*Clear in value*: no uncertainty about which direction is good and which is bad.
*Clear in content*: easily understandable, with units that make sense, expressed in imaginable, not eyeglassing, numbers.
*Compelling*: interesting, exciting, suggestive of effective action.
*Policy relevant*: for all stakeholders in the system, including the least powerful.
*Feasible*: measurable at reasonable cost.
*Sufficient*: not too much information to comprehend, not too little to give an adequate picture of the situation.
*Timely*: compilable without long delays.
*Appropriate in scale*: not over or under-aggregated.
*Democratic*: people should have input to indicator choice and have access to results.
*Supplementary*: should include what people can’t measure for themselves (such as radioactive emissions, or satellite imagery).
*Participatory*: should make use of what people can measure for themselves (such as river water quality or local biodiversity) and compile it to provide geographic or time overviews.
*Hierarchical*: so a user can delve down to details if desired but can also get the general message quickly.
*Physical*: money and prices are noisy, inflatable, slippery, and unstably exchangeable. Since sustainable development is to a large extent concerned with physical things — food, water, pollutants, forests, houses, health — it’s best wherever possible to measure it in physical units. (Tons of oil, not dollars' worth of oil; years of healthy life, not expenditures on health care.)

*Leading*: so they can provide information in time to act on it.

*Tentative*: up for discussion, learning, and change. (We should have replaced the GNP index decades ago, for example, but it became too institutionalized to do so.)


Effective indicators should be:

- Relevant
- Easy to understand
- Reliable
- Based on accessible data

Source: UNECE, 2005:3, Background paper. 41

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40 Meadows, op cit.
41 UNECE, 2005. Background paper on development of indicators to measure implementation of the UNECE strategy for ESD. UNECE. http://www.unece.org/env/edd/inf/meeting/docs/Discussion50paperIndicators5.doc
“Sustainable development is a call to expand the economic calculus to include the top (development) and the bottom (sustainability) of the triangle. The three most basic aggregate measures of sustainable development are the sufficiency with which ultimate ends are realized for all people, the efficiency with which ultimate means are translated into ultimate ends, and the sustainability of use of ultimate means. Extending the definition of capital to natural, human, and social capital could provide an easily understood base for calculating and integrating the Daly triangle.”

On this, Pintér et al. (2005:5) point out that a review of the ‘Compendium of Sustainable Development Indicator [SDI] Initiatives’, a database which keeps trace of SD indicator efforts 15, showed about 700 entries for SDI initiatives and projects underway by the end of last year. The considerable interest in indicators in industrialised and, albeit to a lesser extent, less industrialised countries, was to some extent originated in and been reflective of the UN’s strong engagement in indicator development and their promotion (e.g. the indicator system / set developed by the United Nations Commission for Sustainable Development (UNCSD) 16). This is expressed in some of the related key documents on SD such as the UN’s Agenda 21, where Chapter 40 calls on countries and the international community to develop indicators of SD, to increase focus on SD and to assist decision-makers at all levels to adopt sound national SD policies.

Unlike the aforementioned environmental indicators though, SDIs are supposed to encompass all dimensions of SD (e.g. following on from the most popular models of sustainability, they should address its three ‘pillars’, i.e. the ecological, social and economic dimensions) in ways that are not simply additive but integrative (Born & de Haan, n.d.2, translation ours):

“SD indicators are definable, measurable variables, whose absolute data or pace and direction of alteration respectively are supposed to show whether a country, a region, a community or a project are changing at the time elapsed towards sustainable development. Correspondingly, SD indicators describe the actual state and future trends in relation to sustainability”.

However, as suggested above, defining SDIs is no easy task (see Bossel, 1999), since there are a variety of competing conceptions of SD and it must be recognised that any understanding of what SD means remains provisional in this developing field of inquiry and activity. And, as Pintér et al. (2005:5) again note, “the diversity of core values, theories on SD and the proliferation of SDI processes typically result in the development and application of many different conceptual frameworks”.

We note two general points here.

First, that the monitoring and evaluation of SD requires a set of measures for participants in SD that relay important and meaningful information about the overall system and its subcomponents with which they work. In turn, this requires:

• data to be available over time to report states, trends and rate of change;
• reliable and accurate data that are valid and reflect the model of reality in use;
• acceptable costs for producing and analysing essential data to encourage SDI usage; and
• reports that are understandable, meaningful, and can be easily communicated, e.g. in setting out the indicators, what they refer to, and what has been found.

15 See: http://www.iisd.org/measure/compendium/
16 Based on voluntary national testing and expert group consultations, a core set of 58 indicators and methodology sheets are available for all countries to use (see http://www.un.org/esa/sustdev/natlinfo/indicators/iisd.htm).
Second, being implicit within many of the models and visions of SD, education is assigned an important role to bring about social change and enhance governance. That is, education, within formal, informal or non-formal contexts, should address any shortcomings in performance revealed by the SDIs, which by extension, requires a sound model that measures system states, behaviours, or activity against it. 

We return to the first point below, but regarding the second, we note that over recent decades – particularly since the World Conservation Strategy of the 1980s, the World Commission on Environment and Development (WCED, or the Brundtland Report) in the late 1980s, and Agenda 21 for the 1990s – this has become the focus of much public policy about SD and its evaluation, particularly in relation to education, training and capacity building.

To start with, as mentioned above, Agenda 21 established a mandate for the United Nations to formulate a set of indicators to help gauge progress towards SD:

“Indicators of sustainable development need to be developed to provide solid bases for decision making at all levels and to contribute to the self-regulating sustainability of integrated environment and development systems.”

— Chapter 40.4 of Agenda 21, from the UN Earth Summit in Rio, 1992

Chapter 37 of Agenda 21 (UN, 1993) on creating capacity for SD, links to the broader themes of Chapter 36, on education and training, arguing:

“A country’s ability to develop more sustainably depends on the capacity of its people and institutions to understand complex environment and development issues so that they can make the right development choices. People need to have the expertise to understand the potential and the limits of the environment. They will face difficult policy choices when dealing with such complex problems as global climate change and protecting biodiversity. This will require scientific, technological, organizational, institutional and other skills.”

— (Keating, 1993) 46

Here, the core indicators 47 for the sub-theme of ‘Education Level’ included in the UN Commission for Sustainable Development social indicators framework for education, are: ‘Children Reaching Grade 5 of Primary Education’ (p.103) and ‘Adult Secondary Education Achievement Level’ (p.106), while for the subtheme of ‘Literacy’, it is ‘Adult Literacy Rate’ (p.109). All are expressed as percentages, listed by sex, and identify UNESCO as the lead agency. Associated goals, targets and standards (p.300) that position education as a ‘Driving Force’ within the UN’s Driving Force-State-Response Framework for SD (p.302) are:

- Education Level - Universal access, and completion of primary education by 2015 (Jomtien 1990, Cairo 1994, Beijing 1995)

The CSD’s report giving guidelines and methodologies for indicators of SD is a model of good practice for indicators. It provides a rationale for the indicator in terms of its relevance to SD policy and ‘unsustainable development’ (in terms of scale and quality of human resources and human capital stock), how the indicator is measured and calculated, links with International Conventions and Agreements and International Targets/Recommended Standards, alongside
discussion of limitations; alternatives; data requirements, availability and sources; and references to existing UN work. It also states a direct link between education and achieving SD (pp. 33-4):

“Education, as a lifelong process, is widely accepted as a fundamental prerequisite for the achievement of sustainable development. It cuts across all areas of Agenda 21, being a particularly critical element in meeting basic human needs, and in achieving equity, capacity building, access to information, and strengthening science. Education is also recognized as a means of changing consumption and production patterns to a more sustainable path.

Education, both formal and informal, is regarded as a process by which human beings and societies can reach their full potential. There is a close association between the general level of education attained and the persistence of poverty irrespective of the level of a country’s development. It is vital to changing people’s attitudes to achieve ethical awareness, values, attitudes, skills, and behaviour consistent with the goal of building a more sustainable society. In this way, people are better equipped to participate in decision-making that adequately and successfully addresses environment and development issues.

Education in Agenda 21 is organized around the three issues of:
• reorienting education towards sustainable development;
• increasing public awareness; and
• promoting training.

The primary objectives in addressing these issues include: striving for universal access to basic education, reducing adult illiteracy, integrating sustainable development concepts in all education programmes to achieve interdisciplinary learning, promoting broad public awareness, and strengthening vocational and scientific training.”

[The themes and sub-themes remain unchanged in proposed revisions in 2006 to the CSD indicator set 48; although existing indicators have been revised and new indicators have been added; including a name change for the indicator on secondary and/or tertiary education to adult schooling attainment, as non-formal education is not covered by the indicator; and Eurostat is identified as the lead agency on the non-core indicator of lifelong learning (the proportion of the working age population receiving learning or training, given that ‘the scale and quality of human resources are major determinants of both the creation of new knowledge and its dissemination’). We note that ESD or the DESD are not included in the proposed revisions to the indicator set;]

The CSD themes and claims are returned to in the UN’s Decade for ESD, as described below. They are also echoed in the recently revised EU SD Strategy (2006, para. 14, 109/17/06) 50, stating:

“Education is a prerequisite for promoting the behavioural changes and providing all citizens with the key competences needed to achieve sustainable development. Success in reversing unsustainable trends will to a large extent depend on high-quality education for sustainable development at all levels of education including education on issues such as the sustainable use of energies and transport systems, sustainable consumption and production patterns, health, media competence and responsible global citizenship.”

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As mentioned before, the UN recently highlighted ESD as a matter of global importance by declaring a Decade for ESD (DESID, 2005-2014), at their 57th Session (20 December, 2002) with UNESCO as the lead agency. UNESCO’s vision and objectives for the Decade are:

“The vision of education for sustainable development is a world where everyone has the opportunity to benefit from quality education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation. The proposed DESID objectives are to:
1. give an enhanced profile to the central role of education and learning in the common pursuit of sustainable development;
2. facilitate links and networking, exchange and interaction among stakeholders in ESD;
3. provide a space and opportunity for refining and promoting the vision of, and transition to sustainable development - through all forms of learning and public awareness;
4. foster increased quality of teaching and learning in education for sustainable development;
5. develop strategies at every level to strengthen capacity in ESD.”

The Decade both capitalises on, and has prompted, renewed interest in the role and contributions of education in fostering SD, as illustrated by a range of high-profile initiatives across Europe:

• “Learning to change our world”, EAEA International Consultation Conference on ESD (Göteborg, 4-7 May 2004)
• the Danish Opening Conference for the United Nations DESID (Copenhagen, 10-11 March 2005)

Within each initiative, and to return to the first general point made above, there has been much discussion of the need for monitoring and evaluation of ESD: of policy implementation, effectiveness of the measures taken and the activities, and the impacts and outcomes at an individual and societal level. And, while establishing causal links between inputs and outputs to the system of ESD are presumed to be beyond the scope and understanding of what is required by the actors in this field, objective and accurate measures of processes, throughput and results at the policy level are not.

Furthermore, we can also note that in relation to the DESID, ESD indicators (their formulation, application and discussion) are no longer deemed to be the preserve and remit of policy-makers and statisticians. Stakeholder engagement is expected, which is in line with the strong emphasis placed on public participation within Agenda 21, and indeed, participation is often argued to complete the circle, in that it can prove to be an effective means for promoting ownership, action and accountability for the vision and values embedded in the ESD indicators. What remains unclear though at this stage is the consensus and acceptance of the models of SD, education and ESD to which the indicators are to refer. This leads us to ask, how has all this been received in relation to education, SD, and indicators for ESD?

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55 Details available online at: http://www.learning2004.se.
56 Details available online at: http://www.unece.org/events.php?aid=5523.
57 Details available online at: http://www.unece.org/en/esd/
58 Details available online at: http://www.bmbwk.gv.at/europa/bildung/esd.xml.
The emergence of indicators for ESD

“Where there is no reliable accounting and therefore no competent knowledge of the economic and ecological effects of our lives, we cannot live lives that are economically and ecologically responsible.”

— Wendell Berry

While national policy initiatives and strategies related to ESD are now clearly underway in many European countries, the effectiveness and value of their conceptualisation and implementation, along with the measurement and evaluation of their progress, remain open questions for policy makers, academic researchers and practitioners alike. In the following sections, we rehearse and discuss key questions and potential responses to them as they arose at the AGF-sponsored workshops on these topics; but before then, we sketch the emergence of three successive waves of indicator initiatives in this field to provide a context to those debates.

Early initiatives and precedents

Common tools and methodologies for measuring and evaluating the progress of newly implemented initiatives in education and SD are well established. They include evaluation studies (e.g. the National Foundation for Educational Research’s (NFER) study of the implementation of the ‘citizenship’ curriculum in England), research studies accompanying model projects (e.g. the German BLK ‘21’ Programme), and the use of agreed indicators, typically drawing on work on indicators in economic modelling (e.g. the UK’s Quality of Life indicators, developed by the Department for Environment, Transport and Regions, DETR).

As we will show below, indicators have become a prominent evaluation tool for ESD. The first wave of SD indicators that addressed education followed the call for the development of indicators at the Rio Summit in 1992, as mentioned in the previous section. Work across Europe prior to or alongside the work of the UN CSD attempted to establish a baseline of the current state of sustainability and quality of life at community and national levels (Local Agenda 21 and Agenda 21 indicator initiatives, respectively). The New Economics Foundation (NEF, 2002) characterises the first wave of measures as science-based and focused on developing single indices for SD. A prominent example is the Genuine Progress Index, developed by Redefining Progress, USA, which has gone on to champion measures based on ecological footprinting. These indicators were largely driven by academics and academic interests, and were criticised for not engaging policy makers and the general public, and not explicitly addressing education in relation to SD.

The second wave of indicators shifted the focus to measuring and reviewing progress towards sustainability (NEF, 2002). These indicator initiatives, emerging around and after the Rio Summit, were driven more by governments who, according to NEF, applied a more pragmatic and ‘user-friendly’ approach. The second wave indicator initiatives encouraged the development of indicator sets made up of social, environmental and economic indicators instead of single indices. Examples include the national UK Quality of Life indicators (DETR), and the European Common Indicators (European Commission). NEF notes that little evaluation took place to understand the difference indicators made at the level of, and in, local governance. For example, it was not clear to what extent these measurements influenced decision-making and actions to improve sustainability and quality of life. NEF also argued there was little systematic understanding of the critical success factors for measurement to be effective, and where it had taken place, they concluded that

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57 Cited in Meadows, op cit. p.76.
“current indicator systems in local governments are weak in influencing actions aimed at improving identified trends in quality of life” (ibid., p.3).

To summarise these initial phases of indicator development, understandings of national and local-scale SD indicators from the 1990s tended to focus on indicators in broad economic, social and environmental terms, to the detriment of what was then – or has now come to be – associated with the features and components of ESD, e.g. environmental education, whole school approaches, and systemic models of learning and change in relation to SD. Accordingly, in the UK when education indicators were developed during the second wave (typically through Local Agenda 21 consultations and initiatives), they tended to focus on general features of education and provision (levels and outputs), rather than on specific subject areas or outcomes from the curriculum. A similar situation occurred in Germany, and both can be contrasted with the response in Denmark at that time, where the indicator for education was the number of ‘green schools’. The following examples from UK local government in the 1990s illustrate both the degree of conventionality and innovation in approaches to second wave education indicators for SD, the level of use of objective and subjective indicators, and the variety and lack of uniformity and coherence in the indicator sets across England, at that time.

<table>
<thead>
<tr>
<th>Information and education:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Percentage of children with 5 or more A-C GCSE passes</td>
</tr>
<tr>
<td>- Percentage of children with 5 or more A-G GCSE passes</td>
</tr>
<tr>
<td>- Adult literacy % of adults whose level of English or maths have made it difficult for them in certain situations</td>
</tr>
</tbody>
</table>

*Sustainable Indicators for Oldham - October 1995*

<table>
<thead>
<tr>
<th>Access to educational opportunities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Proportion of young people leaving youth training and finding employment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Increasing Knowledge:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Children under 5 in nursery/pre-school</td>
</tr>
<tr>
<td>- Adult population in ft &amp; p/t learning</td>
</tr>
<tr>
<td>- Numbers attaining national targets for education and numbers receiving mandatory awards by borough</td>
</tr>
<tr>
<td>- Overcrowding in schools</td>
</tr>
<tr>
<td>- Do minority groups have a fair representation amongst school governors (percentage)?</td>
</tr>
</tbody>
</table>

*Lancashire’s Green Audit 2 - April 1997*

<table>
<thead>
<tr>
<th>Access to Education, Training and Information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- School-Leavers’ Exam Results</td>
</tr>
<tr>
<td>- School-Leavers’ Destinations</td>
</tr>
<tr>
<td>- School-Leavers’ Exam Literacy</td>
</tr>
</tbody>
</table>

*East Hampshire Local Agenda 21 - Spring 1996*

<table>
<thead>
<tr>
<th>Education and awareness:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Percentage of households which have heard of LA21 or sustainable development</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Schools:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The number of child casualties on the roads</td>
</tr>
<tr>
<td>- The percentage shift from car journeys to walking and cycling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education for life:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Percentage of under 5’s receiving education in schools maintained in Merton local education authority</td>
</tr>
<tr>
<td>- Number of adult Merton residents in training or education</td>
</tr>
<tr>
<td>- Attainment of Basic Education skills</td>
</tr>
<tr>
<td>- Full-time jobs in Merton</td>
</tr>
<tr>
<td>- Part-time jobs in Merton</td>
</tr>
<tr>
<td>- Rate of long term unemployed people in Merton</td>
</tr>
<tr>
<td>- Participation in Merton Local Exchange Trading Scheme (LETS)</td>
</tr>
</tbody>
</table>

*A Helping Hand For A Better Future - A Vision For A Sustainable Merton - 1996*
Everyone has access to skills, knowledge and information:
- number of requests for environmental information
- number of educational establishments undertaking environmental programmes

All sections of the community are empowered to participate in decision-making:
- number of people attending annual community vision conference
- number of schools with school councils


Travel to School:
- Travel distance to schools
- Number of pupils living near the school who walk or cycle
- Number of schools
- Monitor atmospheric pollution
- Number of pupils living further away who use the school bus
- Health statistics such as levels of obesity and asthma in children

Future Outlook for North Norfolk - A Local Agenda 21 Plan - September 1997

Education and training:
- Provision of nursery places
- Provision of green curricula
- The number of people in further and higher education

Local Agenda 21 Brighton and Hove - Safe and Sound - May 1997

Education and Awareness (Objective: Formulate a county Agenda 21 education policy):
- Endorsement by Chief Education Officer
- 30% return of questionnaires
- 15% of governors per year
- 15% of teachers per year
- Joint strategy to encourage positive OFSTED outcome
- Contracts for OCC Community Education staff to include clause on sustainable development
- 70% of OCC Community Education workers involved. Number of newsletters, computer links, forums, conferences, etc.
- Number of newsletters, computer links, forums, conferences, etc.
- 70% improved practices within Community Education
- 70% of OCC Community Education opportunities achieving targets
- Inclusion in 70% of Community Education strategy documents and development plans
- Involvement of wider community in the decision-making process
- List of contact people
- Number of examples of good practice published [Objective: Incorporate practical actions into everyday life: Identify and highlight examples of good practice]

Oxfordshire Agenda 21, Taking Oxfordshire into the 21st century - A vision for sustainable living from the people of Oxfordshire - April 1997

Education - % of population who left school:
- Before age of 12 years
- Between 12 and 17 years
- Between 17 and 19 years
- Completed 1st degree
- Completed Ph.D.

Education:
- Position of schools in league tables, e.g. Sherborne Girls School 71.7% ’93 - No. 103, ’94 - No. 85, etc.

Sherborne and Castleton Environmental Audit - Spring 1997
Criticism levelled at the second wave indicators include:

- the variability in data expectations and requirements (e.g. regarding primary and secondary data collection across education sectors);
- the lack of sustained attention to the curriculum, subject areas and experiences of schooling;
- the absence of a narrowing down of indicator sets, distinguishing, for example, between headline or key indicators, and those of secondary relevance to the local community (e.g. focusing on big picture issues reflecting national or global concerns and data availability, rather than community or locally-attuned indicators; or the preponderance of technical indicators over resonant ones); and
- little evidence of clear action orientation or political commitment to the implications of the measurements (e.g. linkage to educational policy, finding and support, and related initiatives, e.g. in environmental education, eco-schools, NGO and civil society initiatives).

Further criticism of the second wave indicators relates to general issues, of:

- *reliability* (the extent to which a change in the value of an indicator is caused by a change in what it measures and not due to a measurement error, a notorious challenge when working with qualitative or subjective indicators); and
- *comparability* (the extent to which an indicator measures the same thing across time or space, and how, therefore, comparison and context sensitivity might require an indicator set to evolve over time).  

Similar worldwide efforts in community-focused sustainability also developed second wave indicator sets that overlap with the examples from the UK above, and they too should be compared with these critiques. Initial work by the Balaton Group (Meadows, 1998) for instance, generated a range of SD indicators; examples focusing on human capital, and by extension, education, included (p.73):

- Education level of the bottom 10 percent of twenty-year-olds
- Education and skills attributes of population matched with education and skills requirements of built capital
- Percent of time contributed to civic, religious, and other non-profit causes.

Social indicators for SD, developed by the U.S. Interagency Working Group on SD Indicators, place education-specific indicators within a similarly wider set of human capital indicators:

- Population
- Children living in families with only one parent
- Teacher training level
- Contributions of time and money to charity
- Births to single mothers
- School enrolment by level
- Participation in arts and recreation
- People in census tracts with 40 percent or more poverty
- Crime rate
- Life expectancy
- Educational achievement rates
- Homeownership rate.

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60 Roger Levett, of CAG Consultants, notes (source not traced): “Resonant indicators are like headlines in newspapers - they draw us in so we want to know more. But technical indicators are then needed to guide and measure the effectiveness of policies and actions. The two kinds complement each other. We need both.”

61 For example, in 1950, the number of households with a television would have been an indicator of prosperity in the UK; in 1990, so many households have a TV that comparison is meaningless; unless, perhaps, the indicator is recalibrated to reflect the diffusion and penetration of digital, cable or satellite TV services. The point is, both synchronous and diachronic comparison are compromised within the local government examples given their lack of standardisation across regions or attunement to system processes – e.g. regarding the latter point, credential inflation is a phenomenon that plagues comparison of examination results, i.e. over time students there is a tendency for students to score more highly on standard examinations, for a variety of reasons, beyond the scope of this report.

62 Meadows, op cit.

Other education indicators for US communities are compiled at the ‘Sustainable Measures’ website (www.sustainablemeasures.com), where a composite list for education is as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Indicators</th>
</tr>
</thead>
</table>
| **Adult Indicators**   | • Adult education enrollment  
                          • Percentage of persons retrainable with existing funds  
                          • Percentage of population with high school diploma  
                          • Percentage of adults with associate’s, bachelor’s or graduate degree  
                          • Waiting time for adult ESL courses |
| **Children Indicators**| • Number of children on subsidized childcare waiting list  
                          • Number of child care spaces needed in each age group  
                          • Nursery education (number of children attending pre-school) |
| **Literacy Indicators**| • Literacy rate                                                               |
| **Post-secondary Indicators** | • Students entering postsecondary education  
                          • Rate of college graduation (five year rate)  
                          • Technical school graduates employed in field  
                          • Tuition net cost as percent of disposable income  
                          • Degrees awarded from county universities and community colleges  
                          • High school graduates pursuing advanced training  
                          • Number of pupils completing college entrance requirement |
| **Schools Indicators**  | • Operating expenditure per student                                           |
| **Skills Indicators**   | • Numeracy  
                          • High school graduates needing remediation in community colleges or state univ.  
                          • Achievement Test Scores  
                          • Percent of districts with mean test scores equal/above state average  
                          • Percent of districts with graduation rate above state average |
| **Sustainability Indicators** | • Frequency of sustainable development in K-12 curricula  
                          • Sustainable development literacy of the public  
                          • Number of schools in sustainable school program |
| **Teacher Indicators**  | • Ethnic diversity of teaching staff  
                          • Student/teacher ratio  
                          • Education level of faculty  
                          • Average teacher salary |
| **Training Indicators** | • Employer-sponsored training for front-line employees  
                          • Number of residents in job training programs  
                          • Number of residents in vocational programs  
                          • Number of students in job prep programs  
                          • Percent of post-secondary graduates finding employment in their field |
| **Volunteers Indicators** | • Volunteer involvement in schools  
                          • Number of community volunteer programs to support schools |
| **Youth Indicators**    | • High school graduation rates  
                          • Students failing 1st grade  
                          • Television and video use by 6th graders  
                          • School dropout rate  
                          • Schools with 12th grade dropout rate over 10 percent. |
We note here that in the ‘Sustainable Measures’ master set in comparison to the other sets, there is a different degree of prominence given to curriculum and school provision-focused sustainability indicators, alongside categories relating to youth, volunteering, school leaver destinations, and the various stages of lifelong learning. Arguably, this discernable shift of emphasis in indicators across the two waves of indicators, and alongside attempts to address criticisms of the earlier indicator sets, paved the way for a third phase of indicator development, that which is most closely associated with a focus on ESD, and in particular, matching the needs of the DESD, examples of which now follow.

Current initiatives

The following initiatives for the development of ESD indicators are currently underway, and represent our notional third wave of indicator initiatives on education and SD. At time of writing, we note that the initiatives differ in their degree of completion and focus.

A. In March 2005, the UNECE Strategy for Education for Sustainable Development (ESD) was agreed. The strategy is a practical instrument to promote SD through education. “In order to facilitate coordination and review of the Strategy’s implementation”, a Steering Committee and an Expert Group on Indicators for ESD (EG) were set up. The EG held its first meeting at the end of September 2005 in Ede, the Netherlands, to address the purpose, scope, and format of “indicators to measure the effectiveness of the implementation of the Strategy”. Subsequent meetings in Geneva, November 2005; Vienna, March 2006, and the Hague, May 2006, have reviewed and approved draft indicators [Box 1].

The EG distinguished between four types of indicators 64:

“Checklist indicators” provide information on initial policy, legislation, regulatory and governance measures taken by a government in order to implement the Strategy (e.g. whether a coordinating mechanism is in place, whether the Strategy is translated into national/state language(s)).

“Input indicators” provide information on a broader spectrum of activities taking place in terms of the implementation of the Strategy (e.g. amount of public authority money invested in the ESD materials, proportion of publicly supported research on ESD).

“Output indicators” provide information on the results of these activities (e.g. performance of trained teachers, number of businesses involved in ESD projects, ratio of educators who received training on ESD issues).

“Outcome indicators” provide information on the possible impact due to the implementation of the Strategy, in particular its qualitative aspect in terms of values, attitudes and choices in favour of SD (e.g. learning outcomes resulting from ESD partnerships, community-based projects and business involvement).

Its early meetings discussed the methodology to be used to aggregate in a consistent manner 80 initial indicators throughout the whole set.

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Box 1. Summary of indicators for country’s self assessment for UNECE

The revised consolidated set of UNECE indicators (May 2006) comprises 18 indicators with 48 sub-indicators structured according to the 6 issues for reporting, which follow the objectives of the Strategy. There are 45 qualitative sub-indicators and 8 quantitative, of which 5 are of a dual nature. The sub-indicators are of several types: 11 sub-indicators are “checklist”, 29 are “input” (of which 1 is of a dual type), 8 are “output” and 1 is “outcome”. The format of indicators/sub-indicators consists of two parts: a “yes/no” part and a “descriptive” part.

NB Methodology used for the self-assessment not required, summary based on answers to the sub-indicators

<table>
<thead>
<tr>
<th></th>
<th>Indicator 1.1</th>
<th>Prerequisite measures are taken to support the promotion of ESD.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Indicator 1.2</td>
<td>Policy, regulatory and operational frameworks support the promotion of ESD.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Indicator 1.3</td>
<td>National policies support synergies between processes related to SD and ESD.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Indicator 2.1</td>
<td>SD key themes are addressed in formal education.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Indicator 2.2</td>
<td>Strategies to implement ESD are clearly identified.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Indicator 2.3</td>
<td>A whole-institution approach to ESD/SD is promoted.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Indicator 2.4</td>
<td>ESD is addressed by quality assessment / enhancement systems.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Indicator 2.5</td>
<td>ESD methods and instruments for non-formal and informal learning are in place to assess changes in knowledge, attitude and practice.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Indicator 2.6</td>
<td>ESD implementation is a multi-stakeholder process.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Indicator 3.1</td>
<td>ESD is included in the training of educators.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Indicator 3.2</td>
<td>Opportunities exist for educators to cooperate on ESD.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Indicator 4.1</td>
<td>Teaching tools and materials for ESD are produced.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Indicator 4.2</td>
<td>Quality control mechanisms for teaching tools and materials for ESD exist.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Indicator 4.3</td>
<td>Teaching tools and materials for ESD are accessible.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Indicator 5.1</td>
<td>Research on ESD is promoted.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Indicator 5.2</td>
<td>Development of ESD is promoted.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Indicator 5.3</td>
<td>Dissemination of research results on ESD is promoted.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Indicator 6.1</td>
<td>International cooperation on ESD is strengthened within the UNECE region and beyond.</td>
<td></td>
</tr>
</tbody>
</table>
The EG progress report to the Steering Committee notes:

“5. … The conclusion was reached that a unified aggregation of underlying questions for the whole set was not feasible due to the complexity of ESD issues and debatable methodology. Thus, the “tailor-made” approach for each indicator was chosen, but at the same time it was decided to structure all 80 initial indicators into revised indicators with subindicators.

10. The set comprises 18 indicators with 48 sub-indicators structured according to the 6 issues for reporting, which follow the objectives of the Strategy. There are 45 qualitative sub-indicators and 8 quantitative, of which 5 are of a dual nature. The sub-indicators are of several types: 11 sub-indicators are “checklist”, 29 are “input” (of which 1 is of a dual type), 8 are “output” and 1 is “outcome”. The format of indicators/sub-indicators consists of two parts: a “yes/no” part and a “descriptive” part.

11. The list of indicators [see Box 1] includes, in addition to specification of the type of indicator, information on “means and sources of verification”, and is meant as guidance to help National Focal Points find the information necessary to complete the indicators. It was stressed that in some countries the information might be available in sources relevant to “environmental education” or “development education”, which might not necessarily be viewed as ESD but which could nevertheless provide relevant information for populating the indicators on ESD.”

The list of indicators developed by the EG (June 2006) has been sent to national stakeholders for further consultation and refinement, for finalisation in 2007, subject to a UNECE Steering Committee on ESD in Geneva, December 2006, reviewing the progress of the EG.

B. Conceptual and implementation activities have taken place in relation to strategy indicators, performance indicators and framework indicators for the UK Government’s (2005) Sustainable Development policy, Securing the Future, which include reference to international SD trends and comparisons, and progress towards the UN’s Millennium Development Goals, alongside specific education baseline and ESD indicators. The strategy contains 20 headline indicators and 48 supporting indicators that “give an overview of sustainable development and the priority areas shared across the UK” (ibid.). The headline framework indicator for education in 2005 was the percentage of 19 year olds with Level 2 qualifications (e.g. five GCSEs at grades C or above, NVQ level 2 or equivalent), while the supporting indicator for ESD has yet to be agreed by the environment and education ministries, which are in the process of consulting stakeholders on the issue (see below). As ‘Securing the Future’ notes, there is a strong case for developing innovative programmes, policies and practices, and these could provide the impetus for a shift from second to third wave approaches throughout the UK in relation to ESD (again, see below).

C. The German National Strategy for Sustainable Development contains 21 key indicators, three of which related to education. They highlight: (i) the number of foreign students graduating from school, (ii) the vocational education situation of 25 years olds, and (iii) the percentage of students enrolling in higher education. There is common agreement that they are of limited scope, and in particular, as in the UK, these current indicators do not address informal learning and the qualities of learning related to ESD, in particular, those regarding “Gestaltungskompetenz” (competence to create/ plan/ innovate). In response, within the

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See also the UK’s Sustainable Development Commission comment: http://www.sd-commission.org.uk/pages/indicators.html.
implementation of the National Plan for Action for Germany for the DESD, the national committee is in the process of developing “a catalogue of measures” which will serve as guidelines for strengthening ESD in Germany and assessing progress through indicatorisation. This too illustrates a shift away from a second wave approach, and is discussed in detail below.

D. The Nordic Minister Council (an organisation for formal cooperation between the Government of five Nordic countries) has adopted a revised Strategy for SD for the years 2005-2008. The strategy states that the countries aim to promote ESD by integrating this perspective into their education systems. In May 2005, a Working Group on Indicators for ESD was appointed with the aim to present indicators by June 2006. As all five states are members of the UNECE it was explicitly intended that their work would closely follow that of the UNECE, i.e. it is deliberately a third wave approach in line with UNECE efforts. Recently 12 questions have been presented as ‘indicators’ that were inspired by the UNECE ‘checklist indicators’ and ‘input indicators’ which the Nordic countries are now expected to report back against [Box 2]. These indicators are intended for use for the period 2005–2008. After that it is expected that the indicators would be changed to some kind of “Output indicators” and “Outcome indicators”, as recommended by, and in line with, the UNECE EG approach.

E. In Australia, the Australian Government Department of the Environment and Heritage (DEH) has recently funded (May 2006) the Australian Research Institute in Education for Sustainability (ARIES) at Macquarie University, to build a broad framework of national ESD indicators that reflect the reporting needs of the Australian Government and its Stakeholders.

F. The UNESCO-IUCN CEC Asia-Pacific DESD Indicators Project undertaken by UNESCO Bangkok and the Commission on Education and Communication of the World Conservation Union (IUCN), also in conjunction with ARIES at Macquarie University, aims to assist with the monitoring of progress and achievements of the DESD in the Asia-Pacific. The intention is to produce a set of Guidelines to assist UNESCO Member States with the development of ESD indicators at the national level 68. Draft guidelines were developed at the Review Meeting of the Asia-Pacific Guidelines for National DESD Indicators, in August 2006, Hiroshima 69. The intention here too is to foster more third wave approaches throughout the region.

Other points of interest can be noted in relation to UNECE. At the first meeting of the UNECE EG, the European Ecoforum 70 proposed an ESD specific indicator:

“It was noted that this is an education for SD strategy and not a sustainable development strategy. The longer-term outcomes should therefore be measured in terms of values, dispositions, skills and knowledge, rather than pre-determined behaviours. Behaviour changes may be relevant to SD per se but may not be a result of learning, they may be a reaction to economic incentives or the threat of penalties. We would suggest an open-ended flexible indicator that promotes learning:

Indicator: The number of groups (classes/ community groups/ companies/ factory teams/ government offices/ etc.) who have discussed and developed their own set of indicators on sustainable development.

A modified version of this position appears in the EG Guidance for Reporting 71:

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Box 2. ESD Indicators in the Nordic Minister Council’s Strategy on Sustainable Development 2005–2008

The Ministries of Education were asked to reply to the 12 questions below. The questions were inspired by the UNECE “Checklist indicators” and “Input indicators”. These indicators were intended to be used throughout the period 2005–2008. After the end of this period it would be meaningful to change to some kind of “Output indicators” and “Outcome indicators”, as used by the UNECE.

1. Which national authority is responsible for achieving the goal for ESD within the framework of the NMC Strategy on SD? What is its mandate and what kind of tools can be used?

2. Is there on the 1st of January 2006 a national strategy for ESD as a part of the national strategy for SD?

3. Are there on the 1st of January 2006 any national policy documents for ESD?

4. To what extent is ESD dealt with on different levels in the national Act for school and Higher Education?

5. To what extent is ESD dealt with in the national curriculum for school and higher education?

6. Is there any special support for promoting “Pre school/School for SD”, “Green school” or “Global school”? State the total number of these kinds of schools.

7. How many universities are there in your country with compulsory courses of at least five weeks study period characterized as ESD?

8. Are there NGO’s involved in the national education system promoting SD? If so, please state them.

9. To what extent are there voluntary adult study organisations involved in ESD and how big part of their activity is in ESD?

10. Are there national networks of researchers for ESD?

11. Are there any companies or trade unions where a great part of their education is characterized as ESD, companies aiming to fulfil the ideas on Corporate Social Responsibility?

12. Is there any education material for ESD that in a simple way can be accessible through the Internet for schools and pre-schools?

“The indicators focus on ESD issues and not on sustainable development (SD) as such. In other words, they measure the effectiveness of the implementation of ESD (as set out in the Strategy), not the progress of SD (e.g. progress in biodiversity, climate change, etc.).”

**The outputs of the UNECE Expert Group**

The EG Background Paper itself (2005:4) proposed the following set of generalised indicators as starting points to evaluate ESD performance in terms of UNECE Strategy implementation:

1. Sustainable development literacy of the public
2. Percent of population that perceive SD a priority
3. Frequency of sustainable development themes in curricula
4. Proportion of schools in sustainable school program
5. Proportion of environmental/SD education programs for a given community
6. Proportion of environmental/SD education programs at secondary and elementary schools
7. Proportion of environmental/SD education programs in institutions of higher education
8. Proportion of educators received training in SD themes.

Box 1 showed the set of UNECE proposed ESD Strategy indicators. Illustrations of the indicators and sub-indicators for ESD can be found in Boxes 3 and 4, including calculation methods.

It should also be noted that both perhaps to a lesser extent in the case of the UNECE project, and to a greater extent in the work of UNESCO Bangkok in the Asia-Pacific region (in relation to establishing indicators to monitor progress during the Decade), work and debate were informed by the goals articulated by the architects of the UN DESD at UNESCO and via its International Implementation Scheme (IIS). Namely, the primary aim here is to document and evaluate progress in relation to the four major thrusts of ESD identified within the DESD:

1. improving access to quality basic education,
2. reorienting existing education programmes,
3. developing public understanding and awareness,
4. providing training.

At one level, these four thrusts provide a concrete framework for developing criteria to evaluate the value and relevance of the UNECE and UNESCO Bangkok indicators and guidance. They can also be related to the various waves of indicators: the first and third thrusts fit well with second wave indicators, the second and fourth with third wave indicators. However, the third and fourth thrusts are not as well served by current ESD indicators, owing to their focus on informal and non-formal education settings and opportunities, and the lack of access to data, e.g. from businesses, families, and other non-institutionalised or evaluated educational contexts. Links to the CSD indicator set are possible here, and should be explored in developing and revising those sets.

It should also be noted that while the development of ESD indicators is evidently taking place and becoming a sophisticated process (accounting, for example, for different phases of implementation as the basis for measurement, such as indicators demonstrating political will of the governments; activity indicators; result indicators, etc.), using indicators as a measure of effectiveness of educational endeavours and progress in SD and ESD remains essentially contested within the fields of practice, policy making, and research and evaluation.

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90 UNECE. 2005. Background paper on development of indicators to measure implementation of the UNECE strategy for ESD. UNECE. http://www.unescobkk.org/en/ed/inf/meeting/docs/Discussion%20paper%20indicators.3.doc
**Box 3. ESD Indicators on key themes for sustainable development addressed in formal education**

**Indicator 2.1, sub-indicator 2.1.1**
Please specify which key themes of SD are addressed explicitly in the curriculum/programme of study at various levels of formal education, by filling in the table below.

(Please tick (V) relevant themes for each level. Use the blank rows to insert additional themes that are considered to be key themes in addressing learning for sustainable development.)

<table>
<thead>
<tr>
<th>Some key themes covered by sustainable development</th>
<th>ISCED Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Peace studies (international relations, security and conflict resolution, partnerships, etc.)</td>
<td></td>
</tr>
<tr>
<td>Ethics and philosophy</td>
<td></td>
</tr>
<tr>
<td>Citizenship, democracy and governance</td>
<td></td>
</tr>
<tr>
<td>Human rights, (including gender, racial and inter-generational equity;)</td>
<td></td>
</tr>
<tr>
<td>Poverty alleviation</td>
<td></td>
</tr>
<tr>
<td>Cultural diversity</td>
<td></td>
</tr>
<tr>
<td>Biological and landscape diversity</td>
<td></td>
</tr>
<tr>
<td>Environmental Protection (Waste management, etc.)</td>
<td></td>
</tr>
<tr>
<td>Ecological principles/ecosystem approach</td>
<td></td>
</tr>
<tr>
<td>Natural resource management (including water, soil, mineral, fossil fuels, etc..)</td>
<td></td>
</tr>
<tr>
<td>Climate change</td>
<td></td>
</tr>
<tr>
<td>Personal and family health (e.g. HIV/AIDS, drug abuse, ...)</td>
<td></td>
</tr>
<tr>
<td>Environmental health (e.g. food and drinking; water quality; pollution)</td>
<td></td>
</tr>
<tr>
<td>Corporate social responsibility</td>
<td></td>
</tr>
<tr>
<td>Production and/or consumption patterns</td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td></td>
</tr>
<tr>
<td>Rural/urban development</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td>Other (countries to add as many as needed)</td>
<td></td>
</tr>
</tbody>
</table>

NB The indicator will be reflected by (a) a scale based on the sum of ticks and (b) changes in the pattern of response between subsequent reports.

The assessment key for this table (max. 102 ticks; “other” not counted) is:

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<th>26–50</th>
<th>51–75</th>
<th>76–100</th>
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</thead>
<tbody>
<tr>
<td>Scale</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
</tbody>
</table>


### Box 4. ESD Indicator table of Competence and learning outcomes for ESD

**Indicator 2.1, sub-indicator 2.1.2**

Please specify the extent to which the following broad areas of competence that support ESD are addressed explicitly in the curriculum/programme of study at various levels of formal education, by filling in the table below. (Please tick (Y) relevant expected learning outcomes for each level. Use the blank rows to insert additional learning outcomes (skills, attitudes and values) that are considered to be key outcomes in your country in learning for sustainable development.)

<table>
<thead>
<tr>
<th>Competence</th>
<th>Expected outcomes</th>
<th>ISCED Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning to learn</strong></td>
<td>- posing analytical questions/critical thinking</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>- understanding complexity/systemic thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- overcoming obstacles/problem-solving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- managing change/problem-setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- creative thinking/future oriented thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- understanding interrelationships across disciplines/holistic approach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- other (countries to add as many as needed)</td>
<td></td>
</tr>
<tr>
<td><strong>Learning to do</strong></td>
<td>- applying learning in a variety of life-wide contexts</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>- decision making, including in situations of uncertainty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- dealing with crises and risks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- acting with responsibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- acting with self-respect</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- acting with determination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- other (countries to add as many as needed)</td>
<td></td>
</tr>
<tr>
<td><strong>Learning to be</strong></td>
<td>- self-confidence</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>- self-expression and communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- coping under stress</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- ability to identify and clarify values (for phase III)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- other (countries to add as many as needed)</td>
<td></td>
</tr>
<tr>
<td><strong>Learning to live and work together</strong></td>
<td>- acting with responsibility (locally and globally)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>- acting with respect for others</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- identifying stakeholders and their interests</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- collaboration/team working</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- participation in democratic decision making</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- negotiation and consensus building</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- distributing responsibilities (subsidiarity)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- other (countries to add as many as needed)</td>
<td></td>
</tr>
</tbody>
</table>

NB The indicator will be reflected by (a) a scale based on the sum of ticks and (b) changes in the pattern of response between subsequent reports. The assessment key for this table (max. 138 ticks; “other” not counted) is:

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<th>15–35</th>
<th>36–70</th>
<th>71–104</th>
<th>105–138</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
</tbody>
</table>

Concerns related to this contestation include: what the main thrusts of ESD should be, or how best to evaluate SD and learning 75; that important debate on theoretical issues is rarely taking place and is being sidelined by the pursuit of policy objectives; and, that practical and technical issues have had a tendency to hijack any discussion or criticism of indicator initiatives. The seminar workshops sought to engage these matters, by examining the state of the art in the development and application of ESD indicators in England and Germany, and the debates and issues these raise for indicator policy, theory and practice in relation to ESD.

The Seminar Themes

The seminar themes address many of the issues and examples raised in the preceding sections. Participants were introduced to the outline and purposes of the seminar and were invited to contribute to particular themes, and be engaged in discussion of all themes. In the following section, the order of presentations and discussion points at the seminar workshops have been changed in a few cases, to maintain the flow of argument in this report. The themes are:

I. The role, purpose and development of indicators in / for policy making
   • Indicators for European Policy Making

II. ESD indicators in / for ESD policy making and practice
   • Indicators as established knowledge and the challenge of transfer through different levels of society
   • Considerations about the indicatorisation of ESD: steps in construction and application of ESD indicators at different levels of the education system
   • Thinking frameworks, learning levels and arenas, and institutional change

III. Perspectives on current ESD indicator development initiatives in Germany and England
   • A catalogue of specific measures to monitor progress: the work of the German National Committee for the Decade
   • Informal ESD in Germany and perspectives on indicator development
   • Perspectives on the development of an indicator for ESD for the UK SD strategy
   • The role and potential of ESD indicators within a whole school approach and school self evaluation in England

IV. Current cross-national ESD indicator development initiatives: critical reflections
   • UNECE I. Report by the chair of the Expert Group on Indicators for ESD
   • UNECE II. Perspective from a UK expert group member
   • ESD Indicators in the Nordic Minister Council’s Strategy on SD 2005–2008

V. Engaging the ESD indicator debate from multiple perspectives
   • Workshop Theme 1: ESD indicators and models of change and innovation
   • Workshop Theme 2: ESD indicators and related big ideas such as ‘global learning’
   • Workshop Theme 3: ESD indicators and teacher training
   • Measuring ESD: limitations and opportunities
   • Critical challenges for indicators for ESD

The next section of the report discusses these themes in turn, then offers a discussion and summary of major arguments and findings emerging out of the seminar and workshops.

THEME I

The purpose and role of indicators in/for policy making

“That which is good and helpful ought to be growing and that which is bad and hindering ought to be diminishing .... We therefore need, above all else, ... concepts that enable us to choose the right direction of our movement and not merely to measure its speed.”

— E. F. Schumacher

“Indicators must be simultaneously meaningful in two different domains: that of science and that of policy.”

— Wouter Biesiot

1.1 Indicators for European Policy Making - Graham Room

Graham Room’s research has investigated the use of indicators for European policy-making regarding poverty, social exclusion, and more recently, the European knowledge economy. He contributed to the seminar in Bath as the keynote speaker at the start of the seminar.

Room prefaced his contribution by noting that while indicators are typically constructed as measures of national performance, it is not always made clear what the implicit or explicit frameworks are that underlie the models for the indicator set (models of economy, natural capital and society, for instance) — and to which the economic, environmental and social goals associated with the indicators relate. Nor is it always clear to which mode of governance, coordination, or compliance the indicator set is tied - or, how standardised, comparable and compatible these are across diverse contexts.

Room illustrated these general points with examples and criticisms of the shifts within macro-economy perspectives, focusing on shifts from an industrial model of economy to their known and unexpected incompatibilities with those for the ‘New Knowledge Economy’. For Room, any indicator set of the macro-economy is implicitly or explicitly underlined by:

a. a model of economy and society (e.g. about its dynamics and structures);
b. a set of economic and social goals (where are we trying to get to?); and

c. a mode of governance / coordination / compliance (e.g. policy and legislation).

While the consensus around the Keynesian model of national economy has been able to unite positions on the macro-economy, debate is less settled in relation to the recent emergence of a knowledge economy, where we are faced with many more competing perspectives, models and political priorities. Regarding this, Room noted a lack of coherence in terms of the grounding of models, policy goals and modes of governance, particularly when we come to social and environmental indicators. Even though contested positions are valuable to discourse and dialogue, this situation can often lead to an indicator set that lacks intellectual or policy coherence. His
recommendation was to recognise the value of pluralism, but move beyond this, promoting democratic debate aiming at deliberative consensus and coherence.

At the start of the seminar then, Room set out to raise an immediate series of questions about the potential reification and decontextualisation of indicators, and their transparency and validity as useable and timely tools in social policy. During the remainder of his keynote speech, Room illustrated and developed these themes, by questioning the attention given to the financial, administrative and technical burdens associated with creating and maintaining a broad-spectrum set of indicators [for example, indicators of strategy and performance, and framework indicators]. He also illustrated how in relation to policy, European governments increasingly resort to the use of headline and composite indicators of already available statistical data, within a policy evaluation framework that prioritises comparability, timeliness, and as little costs as possible to the indicator set. (The UK’s Sustainable Development indicators are taken to be a case in point here, and it is a situation echoed in the position of the UNECE EG.)

Room suggested this approach to gathering statistics - one that largely relies on the models, goals and methods that are based on prior or previous understandings of economics, the state and policy (e.g. Keynesian and post-Keynesian approaches), rather than on contemporary thinking on these matters is open to challenge. It works, metaphorically speaking, with a ‘rear-view mirror’-oriented methodology toward the role and purpose of indicators within social policy.

In such circumstances, indicators are unlikely to be fit for purpose in two respects:

a. for current times (addressing ‘increasingly globalised, chaotic and fragmented societies and modes of production’), or
b. for a futures-oriented social policy scenario, where policy interventions have to take place within dynamic social, cultural, ecological and economic processes.

Both concerns muddy the field of view that can be gained from ‘rear view mirrors’ (i.e. what can be gathered both rearward and forwards), as illustrated in the contemporary case of societies being faced with having to address the differentiated impacts of both rapid onset and long-term climate change. Here, models, goals and methods are evolving rapidly, while the time frames for establishing how indicators might contribute to our understandings of societal processes and qualities that relate to climate change impacts in both the short and longer term are subject to political, economic and methodological instability.

Room identified a further shortcoming to the ‘rear-view mirror’ approach that serves to elaborate this topical example. It is that the ‘rear-view mirror’ offers little guidance about the trades-off and political choices that must be made in the face of contested goals for late modern, highly interconnected learning societies (be they primarily seen as economic, social or knowledge-related goals). Moreover, the orientation does not illuminate the value of assuming whether the indicators are constructed in ways that presuppose either a unique future or alternatives ones.

Indeed, such a problematic situation is compounded by how an indicator set is framed and interpreted when dealing with system turbulence (e.g. economic cycles, changes in funding regimes for particular policy – economic, educational, environmental, etc.), as well as how turbulence (e.g. process corruption rather than integrity and stability) proceeds across and within the units or subsystems for the indicator. Typically, the unit for an indicator is assumed to be the nation-state, but in the case of SD, we have to consider whether bio-regions might also make more sense on the ground (e.g. education and SD in the form of ESD in Alpine regions is likely to have differing priorities and require different approaches to that associated with the Mediterranean, i.e. we should consider how ESD and indicators thereof transcend political boundaries).
A further complication is the tricky question of what are assumed to be the (embedded) benchmarks within the indicator set, and how valid these are for diverse policy and practice contexts relating to education and SD: be that for the methodology (for example, does it favour statistical measures), or the nation state as the unit of measurement (for example, does it favour some European economies and democratic systems over others).

These issues were shown to be particularly important for understanding the rationale for positioning the nation state as the principal responsible actor for governance and policy implementation. They also obtain in examining how valid a position it is for diverse educational settings, traditions and structures over the duration within and across states, given the current and differentiated experiences of both England and Germany, of European and global societal transformations, and of changing economic power relationships, that are likely to be felt in the short as well as the long term, particularly with regard to global and regional sustainability and security (e.g. the predicted rapid rise of India and China as world economic powers in the 21st century, and consequently the effects on resource use and the environmental challenges this may present). Room provided examples here of current attempts to find indicators for a European knowledge economy. At the broadest level, he argued, such indicators should provide a measure of the ‘investment’ made and the ‘diffusion’ of change towards a knowledge economy across the society. (An analogy can be drawn here with whether such indicators are necessary in relation to strategies for ESD implementation.) Grounded in current experiences with indicators for a knowledge society, Room went on to suggest five points important in general social policy-related indicator appraisal:

a. the extent and quality to which the indicator captures intervening dynamic processes;
b. how well the underlying models are articulated;
c. the clarity of the goals;
d. the clarity of the modes of governance / compliance, and
e. evidence of continuous reflection as to whether the indicators are and remain ‘fit for purpose’.

Room concluded, while social policy indicators have the potential to illuminate change, they can also obfuscate. This is particularly in terms of theories and models of change and its management, but also in relation to assumptions about the measurement, components and units of change (e.g. measures, policy innovation, and the state). Given such potential weaknesses in theory and use, Room ended his keynote with what he saw as the defining question for the ESD field and community, albeit offered with a dash of irony, Why would you want indicators for ESD?
THEME 2

ESD indicators in / for ESD policy-making and practice

“The volume of education has increased and continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind; an education that takes us into the depth of things.”

— E.F. Schumacher

Room’s challenge was addressed directly and tangentially in the following themes of the seminar. The presenters and discussants on Theme 2 addressed the role, purpose and development of ESD indicators in / for ESD policy-making and practice, using examples from Germany and England, and wider European and international initiatives, primarily associated with the UNECE. The examples are discussed in more depth in Theme 3.

2.1 Indicators as established knowledge and the challenge of transfer through different levels of society - Inka Bormann

Bormann’s seminar inputs drew on examples from Germany, the German DESD Committee and the UNECE, to focus attention on the role of indicators in current understandings of systems and activities at different levels of society, and how ‘knowledge transfer’ between the levels might be enhanced through working towards a tighter coupling of the indicators with the levels. For ESD, this could be particularly achieved through the ‘tighter coupling of ESD criteria with already existing instruments for quality enhancement’.

In more detail, Bormann outlined how the role of knowledge in ‘knowledge societies’ has changed in general terms; for example:

- owing to increasing complexity;
- the problem of what now constitutes “safe” knowledge; and
- uncertainty about the outcomes of interventions in complex and non-linear systems, like society.

In order to cope reflexively with innovation strategies and risk, and with unplanned, unexpected or undesired side effects, Bormann suggested that knowledge-based instrumentation is needed as indicators for ESD. In this context, indicators can serve as instruments for informational steering or reflexive governance, key issues raised by Room in his presentation.

Bormann went on to show how recent work in Germany on ESD indicators has developed different sets of indicators for different purposes at different hierarchical levels in the education system. Here, for example, state-level authorities try to gather information that helps to steer knowledge-based, local or regional initiatives towards developing their own sets of quality criteria (often called indicators as well) in order to stimulate sustainable organisational learning.

Bormann saw this is a direct expression of the tension inherent in attempting to work with both a technical and ecological paradigm for ESD, and between accountability and learning in ESD. She

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also suggested the current situation could be understood as the manifestation of a form of ‘loose coupling’ between different hierarchical levels. Thus, in order to support broad enhancement of ESD, tighter coupling of ESD criteria with already existing instruments for quality enhancement might be a sensible and worthwhile course of action for mainstreaming ESD within education (at least for the formal education system in Germany, and to provide a coherent federal picture).

According to Bormann, a precondition for this to happen is, to understand indicators as generating negotiated and orienting knowledge that have to be transferred from development contexts into contexts of application. This can be regarded as a process of positive, distant transfer. Generally, distant knowledge transfer aims at integrating new knowledge into other contexts. However, experience in Germany suggests such transfer often fails (e.g. in relation to the BLK programme 80). In order to address this failure, Bormann offered three main arguments for further consideration within indicator initiatives:

1. to recognise that there is different ‘talk’ (and instruments) at different hierarchical levels, and hence the expectations regarding, and efficacy of, the indicators will differ; for example, indicators for accountability at a political-administrative level (regarding outputs) may require quantitative measures, while criteria for learning at the organisational level (regarding processes) may require qualitative measures;
2. to make sure that indicators and criteria help to stimulate sustainable organisational development, such that in order to reduce the arbitrariness of what is meant with ESD-related actions, tighter coupling is needed, integrating indicator criteria into given legal frameworks for quality enhancement and assessment; and
3. research on transfer should be established in order to confirm expected effects.

2.2 Considerations about the indicatorisation of ESD: steps in construction and application for ESD indicators at different levels of the education system - Horst Rode

Rode also reflected on current indicator developments and debates in Germany in relation to the areas of quality criteria and standards for ESD. In contrast to Bormann, Rode sought to emphasise that these discussion threads denote only the beginning of a discourse that will lead to a practicable instrument for the estimation of progress in ESD, and that the current capacity for indicator usage was largely fragmented by the federal system of governance. For Rode, three key issues have to be addressed:

I. the necessity of constructing a general indicator framework in order to secure possibilities for a systematic development of indicators and to ensure their validity and reliability,
II. the notion that ESD is considered to be a developing – i.e. not yet well established – field of education. Given this, important starting points for the process of indicator development are questions concerning: (a) the definition and development of competencies of learners, (b) the conditions and structures of accommodating and stabilising ESD in educational institutions, and (c) dissemination and implementation throughout the educational systems,
III. how to construct indicators under conditions of scarce data, differing development speeds, and only partially incompatible interpretations and definitions of what ESD should be.

Within this framework of issues, progress in indicator development should be marked by attention to how the different levels of an educational system are addressed by different but interacting indicators. Here, Rode distinguished between the macro (i.e. entire educational systems or substantial parts of them), meso (i.e. educational institutions such as schools, universities or adult education institution), and micro levels (i.e. educational inputs such as classroom activities,

courses, or seminars). Levels for indicatorisation and the key substantive areas can be combined within a matrix that delivers guidelines for developing and testing indicators. For example:

- At the macro level, indicators should take into account the responsibilities of the German states for education and their relationships to the federal level. Indicators could include: progress in implementation efforts, ESD in central curricula and federal programmes, regional and national support structures.
- At the meso level, indicators should reflect measures taken to establish and stabilise ESD within educational institutions.
- At the micro level, indicators should reflect ESD at the classroom level. Indicators could be time allocated for ESD issues, forms and methods of teaching, perceived learning successes – and the viewpoints of teachers and pupils as well.

Finally, Rode illustrated how such a matrix structure is applicable to national as well as international ESD activities and processes, but also argued that an indicator system must be sufficiently flexible to reflect development and changes in ESD.

[The matrix concept is undergoing further development, and a first empirical test is envisioned for 2007 within the framework of a survey about the state of the art of ESD in Germany.]

2.3 Thinking frameworks, learning levels and arenas, and institutional change – Stephen Sterling

Sterling started his presentation by examining various words that relate to ‘indicators’ such as ‘indication’ and ‘indicative’, alongside the word ‘sign’ and the semantic links to terms like ‘signal’, ‘signify’ and ‘significant’. For Sterling, this emphasises two points to consider within indicator development. On the one hand, the importance of what we choose to notice, and on the other, the importance of how we then interpret what we have chosen. Sterling went on to make the point that the paradigm from which we operate or make sense of either the world at one level, or indicators at another, influences how we approach the task and what we choose to notice and how we interpret. Given these distinctions regarding thinking frameworks, Sterling differentiated between two arenas of learning and the qualities of learning they promote:

- **Structured learning** (the intentioned learning amongst students in formal education which arises from educational policies and practices) and
- **Attendant learning** (the social learning response to the challenges of fostering sustainability in organisations, institutions, and their actors).

Sterling also noted different levels of engagement in ESD:

- **Education about sustainability**: which has a content emphasis. This is fairly easily accommodated into the existing system. It promotes learning about change.
- **Education for sustainability**: which has a values and skills emphasis. This involves greening of institutions, and a deeper questioning and reform of purpose, policy and practice. It promotes learning for change.
- **Sustainable education**: which has a capacity building and action emphasis. This involves experiential exploration of sustainable institutions/communities. It promotes reflexive learning as change.

Sterling argued that currently, much indicator discussion is informed by and reflects the dominant mechanistic paradigm. This is characterised by first order learning, with a focus on structured learning and education about sustainability. Conversely, Sterling argued, sustainable education suggests and requires a shift towards an ecological paradigm, which necessarily involves at least
second order learning, and explicit attention to attendant learning and its relation to structured learning.

Sterling also argued that the mechanistic worldview has a tendency to value one set of indicator characteristics, whilst the ecological worldview tends to value another, but both views and preferred indicator types have advantages and disadvantages. Sterling suggests that this tension accounts for (some of) the confusion in the debate about ESD indicators. He concluded that the whole worldview argument can be perceived in terms of spectra of change rather than competing poles which allows the identification of ‘bridging’ indicators which are indicative rather than standardising, stimulating learning rather than fixed milestones. However, regarding the extent to which a worldview argument has ‘some teeth’, it should remind the ESD community that indicators should not solely be associated with judging the effectiveness of delivering a strategy, or meeting the goals of an externally imposed DESD initiatives. Rather, Sterling argued, noting the existence and value of alternative worldviews should prompt consideration of whether ESD is allowed and acknowledged to continue to evolve and develop in its various manifestations, and hence in indicator sets, i.e. at local and community levels, as well as within national and policy level debates about how best to constitute and evaluate ESD.

The differences in worldview are most apparent when tabulated to show the shifts in focus of indicator characteristics by paradigm:

<table>
<thead>
<tr>
<th>Paradigm</th>
<th>Mechanistic worldview</th>
<th>Ecological worldview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specificity</td>
<td>Detailed</td>
<td>General</td>
</tr>
<tr>
<td>Style</td>
<td>Technical</td>
<td>Resonant</td>
</tr>
<tr>
<td>Role</td>
<td>Prescriptive</td>
<td>Indicative</td>
</tr>
<tr>
<td>Focus</td>
<td>Performance</td>
<td>Process</td>
</tr>
<tr>
<td>Context</td>
<td>Generic</td>
<td>Located</td>
</tr>
</tbody>
</table>

Thus for Sterling, it is important that the debate about indicators does not lose sight of the possibility of developing sustainable education-type ESD indicators, which would reflect and prioritise attention on:

- space for emergence and ‘error’
- critical learning systems (self-reflexive)
- systemic rather than piecemeal change
- systemic coherence across institutional policy and practice
- social and organisational learning and ‘collective intelligence’, and
- being indicative, stimulating learning, and subject to re-vision through such learning.
THEME 3

Perspectives on current ESD indicator development initiatives in Germany and England

3.1 Germany

3.1.1 A catalogue of specific measures to monitor progress: report on the work of the German National Committee for the Decade - Inka Bormann & Jutta Nikel

Bormann identified the German National Committee for the DESD as a principal driver in terms of implementing and developing ESD in Germany. According to the national plan of action in Germany, the overarching objective of the Decade for ESD is the comprehensive orientation of the education system towards the concept of SD. All areas of the education system are addressed: schools and universities, extracurricular adult education, vocational training and informal learning, amongst others. In order to achieve this overarching objective, the plan of action sets out four specific strategic objectives, to:

1. Further develop the concept of education for sustainable development and broadly spread good practices.
2. Forge stronger links between individual players and stakeholders in education for sustainable development.
3. Increase public visibility of education for sustainable development.
4. Strengthen international cooperation within education for sustainable development.

November 2005 saw the launch of the second edition of the national action plan. It contains a catalogue of specific measures that supplements the plan of action, and operationalises these goals by specifying participating organisations and players and their contributions, describing in detail the developments towards a comprehensive re-orientation of the entire education system. Because the catalogue contains evaluation criteria, progress of a funded project over time, and therefore progress towards the four strategic objectives, it is measurable and thus amenable to indicatorisation.

Within this work, the National Committee for the DESD is currently developing a self-evaluation mechanism to monitor achievements during the Decade. Official German contributions for the DESD must meet the following criteria: (a) the contribution is innovative; (b) it can serve as a model to others; and (c) it should be based on a complex concept of ESD (e.g. not only the environmental but the social and economic dimensions as well). The evaluation criteria catalogue was developed by adapting the Driving Force-State-Response Model of the UNCSD and represents the operationalisation of the four strategic objectives. The majority of projects cover more than one area, but they are assigned according to the main focus points. Consequently data are generated for each funded project contributing to one of the strategic goals, but also in terms of the educational area and the measures of the responsible stakeholders of the project (p.31). Along with stakeholder submissions of contributions to the Decade, the Committee is asking practitioners to develop a set of approximately four questions to form the basis of their self-evaluation. Stakeholders will answer these questions so that they can be compiled annually, forming part of a monitoring report to the Committee. The purpose of the self-monitoring

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39 For the Driving Force-State-Response-Model of the UN Commission on Sustainable Development, see: http://eal/jrc.it/envind/theory/handb_03.html#Heading5.
initiative is to encourage a learning process within the contributing organisation, as well as the education system as a whole.

Nikel illustrated this work with the example of the German UNESCO-Project schools. The schools project intends to contribute towards progress in formal education but also in teacher education and professional development (Strategic Goal I). Their declared objective is to spread their methods and concepts concerning ESD across schools outside the network. Evaluation criteria are:

- How many other schools has the UNESCO network reached?
- Could teaching and learning material be handed on?
- To what extend and how were UNESCO-project schools be involved in curriculum development related to ESD?
- How does the cooperation with the teacher training institutions look like and has developed?

It is not clear yet though how the indicators will map onto the competence objectives associated with ESD “Gestaltungskompetenz”, namely:

- Future oriented thinking and knowledge about future scenarios and planning
- Ability of interdisciplinary work on solutions of problems and at innovation
- Networked (connected combined) thinking and planning competence
- Solidarity
- Ability of communication and co-operation
- Ability to motivate oneself and others
- Ability to look critically at own and foreign cultures.

3.1.2 Informal ESD in Germany and perspectives on indicator development - Heino Apel

Apel described the status of ESD in informal learning settings in Germany and the difficulties for the search for indicators in this area.

First, Apel noted that what counts as ‘informal learning’ in Germany is diverse and there is no commonly agreed understanding. More recently, and increasingly, the EU framework on the categorisation of vocational and general further education has been used 85. According to this, ‘formal education’ refers to those educational activities that are provided institutionally and that lead to official certification; ‘non-formal’ education refers to educational activities provided institutionally but without certification; and finally, ‘informal education’ to all learning outside institutionally organised programmes. The German Committee for the UN DESD has set up a working group on ‘Informal Education’, which covers programmes and activities offered by NGOs. According to the EU framework this would fall within the ‘non-formal’ category.

Second, Apel argued that informal education (in the EU interpretation) has increased its relevance with the notion of ‘lifelong learning’. Currently, in Germany there are attempts to find ways and measures that demonstrate the value and effects of informal education. The most promising approach at the moment appears to be the portfolio approach to evaluation. This approach provides both a base for certification but also a tool for the learner to evaluate their performance and inform further educational training plans.

Apel surmised that in the context of informal ESD in Germany, there was a lack of research and debate. He argued that both are crucial for indicator development in the educational sector.

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Third, Apel noted that there is little statistical data available on the extent and quality of informal ESD learning. This was attributed to the large variety of providers in the informal setting. There are a variety of organisations and institutions for further and adult education who provide learning opportunities (only) on ESD. They include local authorities (e.g. “Volkshochschulen”), churches, environmental cooperatives, labour societies, ‘third world’ initiatives, private enterprises, etc. This diversity has made it difficult to gain an overview on all providers and their programmes as they are not required to document or evaluate their activities. The only well documented area is the programmes offered by the semi-publicly funded “Volkshochschulen” which can be found in every region. Data suggests that around 1% of the programme can be considered as contributing to environmental education, while ESD is rarely found or named.

Nevertheless, it was noted that in a one-off survey in 1998, data on informal ESD learning were gathered (Giesel et al., 2001). Institutions self-reported the extent to which they offer ESD-oriented courses. Up to one third offered them. The study has not been repeated though. However, it was noted that the German government funds a biannual investigation about the state of environmental education, and in 2003, for the first time, an investigation into ESD. However, the qualitative nature of the investigations limits the possibilities of using data for other indicators. Thus, Apel concluded his presentation noting that in the German context, qualitative evidence about content, types and extend of informal ESD programmes is fragmented. It is only available in partial areas and only over small periods of time. Consequently, for Apel, the development of indicators in the informal sector is not considered possible without additional statistical surveys.

3.2 England

3.2.1 Perspectives on the development of an indicator for ESD for the UK SD strategy - John Huckle

Huckle’s presentation was guided by the intention to provide examples of the variety of approaches to ESD (theory and practice), and the challenge this presents for finding a single indicator with wide appeal: the task set for him as a consultant to government on ESD indicators.

For Huckle, social theories (in particular those addressing issues of human behaviour and its impact on the environment) are an important resource in legitimising and evaluating different approaches to education and ESD, to assist the transition to more sustainable forms of development, and to allow us to evaluate whether ESD is successful in realising this goal.

Huckle described his consultancy work on developing an ESD indicator, commissioned in November 2005 by the Government’s independent environmental watchdog, the Sustainable Development Commission (SDC). He discussed the intention of the Department for Environment, Food and Rural Affairs (Defra, previously DETR) and the Department for Education and Skills (DfES) to develop an indicator to show the impact of formal learning on knowledge and awareness of SD to be agreed in late 2006. The context for this work was the UK Government’s ‘Securing the Future’ policy, its new strategy for SD, launched in March, 2005. The Strategy identified 68 indicators to assess progress during implementation. Within the Strategy the government also identified its intention to develop an ESD indicator to show the impact of formal learning on knowledge and awareness of SD. The SDC was given the responsibility of developing possible approaches for this indicator, and forwarding its proposals to Defra and DfES.

As part of his early involvement in the project, Huckle requested a redefinition of terms for the aim of the indicator, changing the wording to “the extent to which learners have developed the skills, knowledge and value base to be active citizens in creating a more sustainable society”. In this

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way, Huckle argued it would better reflect the first objective of the DfES action plan for SD 87 and emphasise values and skills alongside knowledge and awareness. On an extended handout, seminar participants were provided with an overview of the six proposed indicator approaches, representing six distinctive rationales, frameworks of learning outcomes, and related modes of assessment; alongside sample assessment and survey instruments and discussion of the possible advantages and disadvantages of each approach. Each option yielded its own indicator:

1. The sustainability literacy approach *

   *Indicator* - The percentage of learners who attain the required level of sustainability literacy.

2. The sustainable schools approach *

   *Indicator* – The percentage of learners able to relate activities carried out in schools to key themes of SD and recognise the values, skills and knowledge that are relevant to taking considered action on issues relating to such development.

3. The citizenship survey approach

   *Indicator* - The percentage of learners who report knowledge, attitudes and activities relevant to active citizenship for a sustainable society in questionnaires that form part of an ongoing NFER study.

4. The action research approach

   *Indicator* - The percentage of learners who have successfully taken part in action learning designed to explore ways of creating a more sustainable society.

5. The frame of mind approach *

   *Indicator* - The percentage of learners who have development sustainability as a frame of mind.

6. The dilemma approach

   *Indicator* - The percentage of learners having the skill to match imaginary characters’ decisions to the knowledge and values that is likely to have prompted such decisions.

   (*Approaches for which a sample test/survey instrument was written.*)

Huckle then discussed the process of stakeholder consultation for members of the UK ESD community, held at DfES in February 2006, and the emerging points of debate. Stakeholder workshop participants were asked to identify their first and second choices from the six approaches suggested – the result was that the action research approach emerged as the favoured option, and there was some support for the sustainable schools approach. Huckle also reported there was clear suspicion, or on occasion, outright rejection, of any approach that sought to test prescribed knowledge, skills and values.

They were also asked to rate the two approaches with reference to eight criteria: validity, reliability, simplicity, objectivity, cost, equal opportunities, good practice, and government policy; although commentary on the outcomes of this was not presented. However, as a final remark to his presentation, Huckle quoted Neal Lawson (writing in *The Guardian* newspaper, 24.2.06) criticising New Labour education policies in terms of their “grim view of change in which people only respond to targets or competition.” He pointed out the following contradiction: “Sufficient to say that while on the one hand the DfES seeks sustainable schools that encourage pupils to care for themselves, others and the environment, on the other hand it continues to introduce policies which undermine the comprehensive [schools] principle and in Lawson’s words leave little space for the consensus, cooperation and caring that many would see as essential for SD.” 88

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3.2.2 The role and potential of ESD indicators within a whole school approach and school self-evaluation in England - Leszek Iwaskow

Iwaskow works as Her Majesty’s School Inspector for Geography and has responsibility for ESD. He engaged with the theme of ESD indicators from his broad range of experiences in schooling practice regarding inspection and ESD. Iwaskow argued two main points: first, he emphasised the importance of spreading ESD across the subject disciplines; and second, the benefit of raising awareness and consciousness among practitioners and policy makers for existing (albeit as yet unpublished) ESD ‘best practices’ in schools. Central to Iwaskow’s vision of indicators for ESD is addressing the role of ESD within a whole school approach. Here, Iwaskow recommended making ESD central to the mission statement of schools, and consequently it would then become a focus of inspection and self-evaluation for government inspectors and the school community. Iwaskow hoped that this approach would evoke awareness of ESD at ‘higher’ levels of the educational system, and it should be noted, that this was the strategy currently being put into place through the national government’s Sustainable Schools Framework.

In more detail, Iwaskow’s starting point was desiring change in schools (i.e. at the micro level) towards implementing ESD. This fitted well with what he considered to be two main options to hand for the implementation of ESD into the formal education system, i.e. ‘evolution vs. revolution’, or with what perhaps can also be described with the notions of ‘quality bottom up’ vs. ‘quantity top down’ approaches for the implementation of ESD. But for Iwaskow, implementing ESD should never be reduced to simply ‘talking the talk’ but move on to ‘walking the walk’, that is, risking taking first steps, possibly without having a ‘perfect theory’ to hand. His recommendation was to look at closer linkages between ESD and other educational ‘campaigns’, such as the Every Child Matters agenda (ECMH) in England. Stressing this ‘fit’ between ESD and ECMH could, for example, provide an ‘anchoring point’ for ESD in existing inspection frameworks, or even better, create one within the recently introduced self-evaluation framework for schools. Iwaskow argued that it is at this point that ESD indicators can come into ‘play’ in a fairly open, developmental, and generic manner. For example, the self-evaluation framework could also be regarded as an eventual framework for indicators in general, using the ‘tick-off’ questions as checklists similar to those provided by UNECE in benchmarking ESD activity. However, Iwaskow also argued that even with the aforementioned ‘walk the walk’ perspective, a ‘trail and error’ stance should not ignored or devalued during inspection or self-evaluation.

Last but not least, Iwaskow argued that an increased spread of ESD across the board in schools was not only important and valuable in its own right but also showed how ESD could be considered as ‘quality education’, which possibly would enhance the quality of education (school life) in general. Thus ‘basic ESD principles’ such as caring for the environment and each other could be seen to fit with anti-bullying and anti-racist messages and agendas within schools.

In contrast to the German examples then, we can note that what was absent from both English perspectives was sustained attention to the macro-level, and for the German examples, sustained attention to the micro-level.
THEME 4

Current cross-national ESD indicator development initiatives – critical reflections

4.1 UNECE I – Report by the chair of the Expert Group on Indicators for ESD - Roel van Raaij

Roel van Raaij introduced the work of the UNECE Expert Group on Indicators for ESD (EG). The EG was given the task of developing indicators to measure the effectiveness of the implementation of the UNECE Strategy for ESD in member states (see earlier for explanation).

The indicators initiative is part of the UNECE Strategy for ESD (passed in March 2005 in Vilnius), which has the objective of facilitating the introduction and promotion of ESD in the UNECE region, and realising the UNECE’s common vision of ESD. In more detail, the aim of the strategy is to encourage UNECE Member States to develop and incorporate ESD into their formal education systems, in all relevant subjects, and in non-formal and informal education. Indicators developed by the group, therefore, should have relevance to the UNECE network of 55 countries from Europe, the former USSR, the USA and Canada, and are targeted at both ministries of education and environment, particularly in terms of their National Action Plans for SD and ESD.

The following objectives further describe the strategy objectives:

1. ensure that policy, regulatory and operational frameworks support ESD;
2. promote SD through formal, non-formal and informal learning;
3. equip educators with the competences to include SD in their teaching;
4. ensure that adequate tools and materials for ESD are accessible;
5. promote research on and development of ESD; and
6. strengthen cooperation on ESD at all levels within the UNECE region.

Van Raaij reported on the EG work schedule of four 3-day meetings (Sept 2005-May 2006) to produce a “framework” of indicators. The EG consisted of expert representatives from Sweden, Lithuania, UK, Austria, Slovenia, Germany, Armenia, Greece, Italy, Russia, CAREC, Ecoforum, UNESCO, UNECE, Canada (by mail) [although further notes about the selection process and qualifications of experts have not been made available]. The EG has proposed an indicator system for approval to the Steering Committee meeting in Geneva, December 2006. If approved, it will be piloted in 6-8 countries, with the aim of reporting findings to a Ministers conference in Belgrade, 2007.

Methodologically, the EG’s work was described as ‘essentially about setting up a ‘framework’ for indicators’, translating objectives into questions (what do we need to know, what do we want to know, which data are available, what methodology is available); and consequently, constructing indicators out of these questions, as far as aggregation, and qualitative and quantitative data and methods are available.

Van Raaij reported that the group agreed that in developing the concepts, the following common ground assumptions were taken into account:

a. SD is not a fixed goal, but a developing concept, process oriented;

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b. “Learning” is a broad concept, especially in ESD regarding non-formal and informal education (for most non-educators it is a “black box process”);
c. Education refers to knowledge, but also to attitudes, values, skills, competences, behaviour. A key issue is how to capture it all;
d. Methodology may be demanding in some respects;
e. Data are not always available, besides some in the field of formal education; and
f. That education contributes to SD is a matter of trust and can be described in a logical chain, but we can’t “prove” SD is as a result of education alone.

Van Raaij explained that one of the earliest tasks of the EG was to construct an evaluation model (e.g. similar to those generally used in effectiveness evaluations\(^\text{94}\) ) which covers:

I. the process of implementation;
II. the effectiveness of the implementation (as a qualitative feature of both the process and long term effects of ESD), and further,
III. which helps to distinguish between different types of indicators in relation to different phases of the process of implementation.

The model is presented in Figure 4. In a later stage the different phases of the implementation where linked with the ESD strategies objectives, to develop indicators for each objective.

**Figure 4. Background for the UNECE Expert Group work: evaluation model**

As shown in Figure 4, the group worked with 5 types of indicators:

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\(^{94}\) See, for example: Heneveld, W., 2000. ‘Introduction to school effectiveness’. Internal paper. World Bank, Washington DC.

Type 0: Base-line indicators (data) – showing the existing situation in relation to an issue at a certain point in time.

Type 1: Checklist indicators – providing information on initial policy, legislation, regulatory and governance measures taken by a government in order to implement the strategy.

Type 2: Input Indicators – providing information on a broader spectrum of activities taking place in terms of conducting activities on ESD.

Type 3: Output Indicators – providing information in the results of these activities.

Type 4: Outcome indicators – providing information on the possible impact due to the implementation of the strategy, in particular its qualitative aspect in terms of values, attitudes and choices in favour of SD.

Van Raaij also mentioned three features of their ongoing discussions at the EG to provide an impression of their interchanges. First, the EG felt the topic of “indigenous people” and their knowledge was insufficiently represented in the objectives, and they proposed that a description on how their knowledge is conserved, used and promoted, be considered as an indicator. Second, the issue of linking various ESD initiatives and the development of tied and independent indicators was also raised. It was particular emphasised that there was a necessity to bring the indicators in line with UNESCO reporting on the DESD, and with available data from other educational monitoring systems (for example, taking part in the UNESCO/IUCN E-debate for the Pacific/Asian Region, with inputs and observers like Daniella Tilbury and Sonja Janousek, ARIES 95 ). Thirdly, the group felt there was a need for the indicator system to be integrated with a “reporting format”, e.g. writing a “guideline on the UNECE indicator set”.

Van Raaij also noted the limitations of the EG’s work, namely, that:

- it operated within the mandate of the expert group,
- UNECE is a political and policy-oriented process (international),
- it had be understood in different countries, cultures, educational systems, political systems and languages,
- it was tied to the text/objectives of the Strategy, and
- it was mostly based on existing data and methodology (Vilnius).

Finally, van Raaij commented critically on the EG’s work and listed the following considerations for future progress:

- With respect of difference between States, each state should consider a baseline report of the situation in 2005, which is useful to measure progress.
- For each country, the possibility of a general ESD-monitoring system should be determined. In national action plans the objectives should be formulated as operational goals.
- Given the nature of the UNECE Strategy itself, correspondingly, most of indicators seemed to be “checklist” or “input” type. The EG is aware of this but van Raaij also noted that it is not in its mandate to change that.
- This system of evaluation is not for benchmarking or reporting only: “in line with the spirit of the Strategy, we should celebrate progress, share good practices and LEARN!”

Assessment mechanisms were subsequently discussed; with the EG Progress Report 96 noting the following:

“12. The assessment mechanism behind the indicators is based on the answers to the sub-indicators that would provide input into the indicator’s assessment. The conclusion was reached that it is not feasible to sum up the answers to the

sub-indicator in a quantitative way to build sound data for the indicator as such. Therefore, the indicator has to be presented as a qualitative judgment of the subindicators. To evaluate the answers provided in the annexed templates, and consequently assess the sub-indicators, the Expert Group has developed an “assessment key”. Following the “tailor-made” approach a variety of rankings is used, expressing numbers, percentage, amounts and state of a process. To ensure consistency across the indicator set, these are expressed as a six-category scale from A (minimum) to F (maximum).”

We also note that the working copy of that document (3 July 2006), includes an additional sentence to that paragraph (see Boxes 3 and 4 for exemplification of the scales). The sentence and its deletion is perhaps illustrative of some of the tensions in how the measures are represented (e.g. in qualitative and quantitative terms):

“This scale in some cases has a non-linear distribution because the maximum and optimum values are not necessarily the same.”

Both versions of the report 97 conclude:

“17. The Expert Group considered that the current set of indicators reflects the state of art and it is the best possible result in accordance with the UNECE Strategy itself, the mandate of the Expert Group, the availability of data and methodology, and the common understanding between different countries, educational systems, cultures and languages. They stressed that the current set of indicators would possibly require a revision following the first reporting exercise and the feedback received from the countries on the workability and feasibility of the indicators and requested information for reporting. Therefore, the Expert Group requested the Steering Committee to extend its mandate to allow for a fifth meeting to revise the set of indicators, if needed, in time for preparing the report for the possible next meeting of the Steering Committee, provided its mandate would be extended at the Belgrade Conference.

18. The Expert Group stressed that the indicators developed for the reporting on the implementation of the UNECE Strategy on ESD would provide valuable input into the UN Decade on ESD. Most of the indicators, as well as the methodology used for their development, could be adapted and used by other regions, and therefore could serve to governments.”

4.2 UNECE II - Paul Vare

Vare reported on his involvement in the UNECE expert group via the European Ecoforum, commenting on two broad questions: (i) why indicators, and (ii) indicators for what, which were discussed during the EG meetings.

In Vare’s perspective, and like Bormann, the EG’s work identified a tension between accountability and learning. This tension became most prominent over issues such as whether questions in the framework asking for “the extent to which x provision in the strategy is being implemented” are sufficient, or whether there is also space for indicators that would promote learning in and of themselves. As an example for such an indicator, Vare noted the following example of a proposed indicator from Ecoforum: “Evidence that groups (classes/community groups/work-based teams, etc) have discussed and developed their own set of indicators on sustainable development.”

Vare argued for the inclusion of such kinds of indicators from his NGO experiences of rural development work, where, in attempting to evaluate project success, the NGO had come to realise that the project objectives tended to change over the lifetime of the project. NGO staff concluded that the real ‘development’ was the change in community perspectives of what the problems (and solutions) were over time. Thus a change in their objectives became an ‘indicator’ for development.

Vare also reported another difficulty the EG faced, which he described as finding a balance between professional judgement and political acceptance regarding the proposed indicator set. In other words, members of the EG feared that if their proposal were perceived as ‘too purist’ the danger was lack of acceptance by the ESD community, or that the executive body (the members of the UNECE ESD Steering Committee) could simply reject the EG’s proposed indicator list if it serviced the needs of the ESD community over that of the Strategy (where these were seen to conflict, for example, over the models of ESD and implementation that each championed). Vare described a strong sense of awareness that if the proposed framework of indicators would be rejected, the group would be regarded as having failed their task and wasted a great deal of time and effort. As a result, this made some members of the group feel uncomfortably about where they were positioned along this spectrum of professional judgement and political acceptance, while others had remarked: “It’s not a matter of what’s right or wrong but what’s better or worse.”

4.3 ESD Indicators in the Nordic Minister Council’s Strategy on SD 2005–2008 - Carl Lindberg

Lindberg discussed Box 2 and the responses to the 12 questions to date. By way of background, Lindberg noted that the Nordic Minister Council (NMC) was an organisation designed to facilitate formal cooperation between the governments of Denmark, Finland, Iceland, Norway and Sweden. In May of 2005, subsequent to their adoption of a Revised Strategy on Sustainable Development for 2005-2008, a Working Group on Indicators for SD was appointed by the NMC. Their task included the development of ESD indicators for presentation to the NMC in June of 2006. He argued that to understand any responses to questions correctly it is important to know that for more than ten years now, the Nordic countries have integrated the fundamental ideas on ESD into their national curricula for schools and pre-schools. However, he also noted much remains to be done to make education correspond with the UNESCO definition of ESD at all levels.

Lindberg also described how given that the aims of the Nordic Region were similar to the UNECE Region, the Group decided to work closely with the EG to develop their indicators. The Nordic Working Group identified a set of twelve indicator questions [Box 2] for their Ministries of Education based on checklist and input indicators. These indicators will be used until the end of the Strategy in 2008 at which time a set of questions based on output and outcome indicators will be developed. ESD development will be measured by comparing the change in the answers on an annual basis.

Lindberg then provided example responses to date from the region:

**A. National strategy examples**

In Finland, a proposal for a national strategy for DESD 2005–2014 was presented to the Minister of Education (February 2006). It contains both a general policy and specific measures for the different education sectors. In Norway, the Agency for school education has received instruction to make a national policy document on ESD. In Sweden, the Parliament has amended the Higher Education Act (February 2006) so that all universities have to promote SD in all their activities. In Iceland, in their strategy on SD (2006–2009), knowledge on environment and society has been stressed as the basic condition to achieve SD.
B. **Examples from compulsory schools and upper secondary schools**

In Denmark, ESD is now formulated as a part of the goal for different levels in the primary school. In Norway, ESD has been integrated in a way so this perspective will be important in education to entail a strong commitment to SD. In Finland, the experience from the Baltic 21 Education action plan has been used in the strategy guidelines. In Sweden, the Government has taken a decision that the goals of all programmes in the upper secondary school (2007) will be permeated by an ESD perspective. In Iceland, there is an Environmental Education Council with the task of supporting environmental education in schools.

C. **Examples of supporting networks**

In all countries there are schools working within networks that aim to support ESD, for example, Eco-schools and Baltic Sea Project schools. In Sweden “School/Pre-school for SD” has been introduced. Good support for this has been introduced with the “Quality Criteria for ESD-schools” initiative 98, in which Danish ESD researchers have been highly active.

D. **Higher Education**

Many universities in the Nordic countries clearly promote SD in their education. Teachers create networks within and between their universities to support ESD. Compulsory courses are permeated by this perspective. There are also transdisciplinary courses. Some universities have compulsory courses of at least five weeks study for all their students with SD content. There are also courses where the students are responsible for both the content and the outcomes. A network of Nordic ESD researchers has been established.

E. **Voluntary adult education**

Within “Folk high schools” and study organisations a great part of their education can be characterized as ESD. NGOs within the environmental area are supporting schools. In some big corporations the perspective of SD has been important in the education of their staff.

F. **Teaching materials**

In the area of Environment and SD, some books have been produced by support from national agencies. There is also support via the Internet. Some examples are: www.skolutveckling.se, www.miljolare.no, www.ubuportalen.dk, and www.umvefur.is.

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98 Breiting, Mayer & Mogensen, op cit.
THEME 5

Engaging the indicators debate from multiple perspectives

“Indicators can be tools of change, learning, and propaganda. Their presence, absence, or prominence affect behaviour. The world would be a very different place if nations prided themselves not on their high GDPs but on their low infant mortality rates. Or if the World Bank ranked countries not by average GDP per capita but by the ratio of the incomes of the richest 10 percent to the poorest 10 percent.

... We try to measure what we value. We come to value what we measure.”

— Donella Meadows

5.1 Workshop Theme 1: ESD indicators and models of change and innovation

5.1.1 The degree of fit and tensions in using indicators in ESD with models of change and innovation - Kim Walker & Steve Gough

Walker and Gough argued that a crucial question raised in the indicator initiatives and examples within Europe was the compatibility and convergence of indicator-based approaches with what we know about educational and social change. Broadly speaking, change can be envisaged as either a linear process or an adaptive process. For the first of these there is a clear process through which:

• the starting point is established
• the desired end point is elaborated in detail
• a sequence of steps leading from one to the other is set out, and milestones identified.

In the alternative adaptive view, complexity of context means that social and educational change is typically a journey across shifting ground during which goals become redefined. In the realm of practice, processes of change often begin by being conceived as linear, and then are subsequently reconceived as non-linear and adaptive as events unfold. It is not just that indicators are compatible with the linear approach but incompatible with the adaptive approach. The problem is that the pursuit of indicators may come to fix in place inappropriately linear approaches that might otherwise be adapted.

Walker and Gough suggested that this was not to say that there is no place for indicators of ESD. The whole area is fraught with complexity and uncertainty, and indicators may well provide a way of enabling individuals to find a way of beginning to address this that suits them. For example, teachers may be able to use a given set of indicators as a way of reducing ESD in all its complexity to a set of actions that are achievable within the context of their own professional practices.

What they did argue, however, was that indicators should be flexible. It may well be that a particular indicator, or set of indicators, is judged to have served its purpose even though it has not actually reached the original target level. This should be no obstacle, in principle, to its replacement by other indicators that present a new spur to action. No one should be surprised at this. It is in the nature of SD, and therefore of ESD, that requirements change over time. Therefore the appropriate indicator set will change too.

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5.1.2 Evaluation tools and experiences in Germany: drivers of indicator development - Hansjörg Seybold

Seybold highlighted at least two functions usually attributed to evaluation: evaluation that accompanies the process of implementation of an innovation or new strategy as formative evaluation; and that which works with the outcomes (or effects) as summative evaluation.

Seybold pointed to the long tradition of survey research in environmental education in Germany, investigating the ‘state of the art’ in German schools. Here, three large scale studies have taken place (1985, 1991, 1996) at Bundes-level, tracing developments over a decade (or so), while two others at the level of Federal state (e.g. Baden-Württemberg), have been undertaken more recently. Bearing in mind that German environmental education in formal schools has to some extent been relabelled and replaced by ESD, and at the same time, survey research has been superseded by an evaluation of model project implementation, in the shape of the BLK 21 programme, Seybold noted that the critical difference was the change in purpose of the evaluations. That is, looking formatively and summatively at how environmental education/ESD is done in ‘normal’ schooling is no longer the focus, while the findings and processes of the surveys are somewhat detached from the work taking place in the model projects. Thus, in term of the development of indicators, Seybold called for a closer relationship between the development of indicators to that of existing (empirical) research (e.g. the aforementioned surveys), and the findings and lessons that could be learnt from that, instead of pursuing what may possibly amount to a ‘reinvention of the wheel’.

5.1.3 Sustainability in higher education: current practices and future developments - Stephen Smith

Smith introduced an ongoing Higher Education Academy (HEA) project looking at ESD work in diverse subject areas in UK higher education. The HEA has “improving the student’s learning experience” as its mission and seeks to provide policy-makers with advice to that end, working through subject centres for academic disciplines to achieve its goals. In this project, there are clear tensions in reviewing the ESD work at the meta-level; indicators of ESD and progress in the subject areas are not treated as though they are contested in the academic subject areas, and Smith argued that broad acceptance of goals and targets using Western models of organisational change and management have reduced the space for alternative perspectives associated with models from further afield.

5.1.4 ESD indicators and models of change and innovation. Case of the APQUA project in Spain - Samira El Boudamoussi

El Boudamoussi presented a case study of a model of change and innovation in Spain: the educational Program APQUA (Learning about Chemicals, their Uses and Applications) developed under a collaboration agreement between SEPUP (Science Education for Public Understanding Program) of the Lawrence Hall of Science of the University of California at Berkeley, and the Department of Chemical Engineering of the University Rovira i Virgili at Tarragona. 

The level of fit and tensions with ESD indicators were discussed and illustrated, in relation to the sources of the programme’s funding (mostly from private rather than public sector) and the involvement of governmental institutions (most of the time, they are departments of environment rather than departments of education). Another source of tension was the fact that APQUA does not define itself as an ESD programme and the ESD indicators may not be applicable unless it is classified *a priori* as such. At the same time, APQUA’s approach and educational objectives seem to fit well with ESD indicators, particularly those applicable to learning processes and educational materials. Moreover, El Boudamoussi argued that the programme is more focused on changing attitudes rather than behaviours as it proceeds on the assumption that attitude change is more likely to lead to behaviour change in the long run. The programme also promotes science literacy and positive critical attitudes towards (learning) science and technology and aims to enhance informed citizenship by promoting “rational” and evidence-based attitudes instead of existing “emotional” attitudes towards chemicals and chemical industry. However, indicators for these broader areas were not considered, nor how they integrate with those for ESD.

5.2 Workshop Theme 2: ESD indicators and related big ideas such as ‘global learning’

5.2.1 Global Education in Germany: actual debates - Gregor Lang-Wojtasik

To give a brief impression of the actual situation and discussions on Global Education within the field of ESD, Lang-Wojtasik’s input focused on three areas:

- quality criteria,
- two main concepts for ESD in Germany, and
- progress in developing a Reference Curriculum.

In talking about Global Education within the field of ESD and the measurement of both, Lang-Wojtasik advised taking into account connected questions in the process of discussion for the German context (Lang-Wojtasik, 2003; Scheunpflug & Asbrand, 2006) 102.

**Quality criteria**

Concerning quality criteria, Lang-Wojtasik explored two main aspects: *input-oriented* and *output-oriented* views. Input-oriented views deal with questions of evaluation in Global Learning, and start with the description of criteria for ‘good Global Learning’. Lang-Wojtasik referred here to six interlinked steps (an evaluation circle): (1) Identifying the subject of the evaluation and which part of the work should be reflected, (2) Selecting methods and collecting information, (3) Interpreting information, (4) Communication about the findings, (5) Defining criteria and indicators, and (6) Developing consequences and objectives.

Evaluations in Global Learning can be carried out externally and internally, they can focus on institutions or organisations, groups, or individuals. In the evaluation process, Lang-Wojtasik argued it was important to differentiate between education, campaigning and good-will activities, and to note that, normally, evaluation in Global Education is a peer-oriented process (Scheunpflug et al., 2003; VENRO, 2003) 103.

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Output-oriented views deal with the question of competencies. Here, Lang-Wojtasik referred to different concepts offering supporting ideas for developing futures-oriented models of evaluation and monitoring (Lang-Wojtasik & Scheunpflug, 2005) 104. The most prominent are as follows:

- **Global Learning as Theory of World Society** (Scheunpflug & Schröck, 2002) 105 – within this concept one of the interlinked levels of education deals with different areas of skill-development: cognitive, methodological, communicative and the personal, aiming to be able to deal with world-complexity (knowledge/non-knowledge, certainty/uncertainty, familiarity/strangeness).
- **DeSeCo – Definition and Selection of Competencies** (Rychen & Salganik, 2003) 106 – the focal point of this concept is the systematization of three different fields: interaction in socially heterogeneous groups, acting autonomously, and using tools interactively.
- **Didactics of politics** (Sander, 2005) 107 – this refers to the ability to form a political opinion, ability to act politically, and methodological ability.
- **Reference Curriculum** (Schreiber, 2005) 108 (see below).

**Two Main Concepts in Germany of ESD**

Two main concepts of ESD in Germany currently deal with the question of quality, its measurement and suitable criteria:

1. First is the concept of “Gestaltungskompetenz” (BLK, 1998) 109, which is an elaborated concept in the field of ESD, focusing on capacities to act and solve problems, based in the context of sustainability. The concept refers to a general field of activities (general education).
2. Second is Global Learning, based in Development Education and focusing on global justice and sustainability. It is a domain-specific concept searching for linkages to school-subjects and/or learning-fields.

**Reference Curriculum – on the way**

The Reference Curriculum relates to work in progress since 2003 of a group within BMZ-KMK. The working group members created a “Global Development” Learning Field within ESD. The domain-specificity includes the idea that all levels of education can be touched, starting from Kindergarten, and including all types of schools. In the concepts three areas of competencies are found: (1) Knowledge and its Acquisition, (2) Values and Valuing, (3) Communication and Action (Schreiber, 2005). These areas are interlinked with eleven sub-competencies: (1) Getting and processing information, (2) Recognising diversity, (3) Analysis of global change, (4) Differentiation of societal acting levels, (5) Change of perspectives and empathy, (6) Critical reflection and positioning, (7) Judging of development-activities, (8) Solidarity and joint-responsibility, (9) Understanding and conflict-resolution, (10) Capability to act, (11) Participation and joint creativity.

5.2.2 **Global education: the case of the UK - Harriet Marshall**

Marshall’s workshop gave examples of indicators (and evaluation) in global education in the UK and exchanged ideas about them. It raised questions about the broader area of global education (in relation to ESD), and discussed ‘the why’ and ‘the how’ of global education before moving on to consider the case of the International School Award (run by the British Council), and the idea of schools’ self-evaluation in the field of global education and ESD, for example, whether or not this idea of self-evaluation in global education was entirely relevant to the issue of ESD indicators.

5.3 Workshop Theme 3: ESD Indicators and Teacher Training

5.3.1 Indicators and teacher training and teacher development – Samira El Boudamoussi

This contribution raised questions about the scope and impact of indicators in relation to teacher training and teacher development based on the assumption that teacher’s practice is influenced not only by training but also by other factors such as the institutional frameworks (curriculum, competences, programmes...), the textbooks and materials used in the classroom.

El Boudamoussi argued that the frameworks for ESD are not usually set by ministries of education. An international comparative study on environmental education and ESD (El Boudamoussi, 2004) showed that in other governmental organisations are usually involved, such as ministries of environment, environmental protection agencies, sustainable development councils, etc. In some cases (e.g. Canada), there is a collaboration between these organisations and the ministry of education, but this is not usually the case. So, a key question here is whether teachers consider or value the frameworks or any recommendations about ESD provided by governmental organizations other than those by the ministry of education.

El Boudamoussi raised a second question related to the availability and characteristics of ESD materials and textbooks. An analysis of such materials conducted in Belgium (Djegham et al., 2006) identified a wide variety of materials produced at different levels: international, national, regional, local (county, city…), schools, and classrooms. But, she asked, to what extent are teachers informed about these materials? Are they prepared to use and integrate them in their daily practice? How prepared are they to face such a controversial subject as SD and to tackle it with their students? Thus, is resistance here, or the speed of acceptance and implementation, something that can be reflected in the indicator set, over time?

Finally, a third question was introduced, related to the role of ESD indicators in enhancing further training on the following aspects:

- Curriculum integration of available ESD materials
- Evaluation of ESD objectives
- Interdisciplinarity (in secondary schools)
- Criteria to select appropriate materials
- Tools/techniques to evaluate students’ outcomes
- Possibilities for interdisciplinary work.

The third question, then, was, do ESD indicators have any role to play in these aspects within initial and ongoing teacher training and professional development?

The next subsections summarise the formal discussion at the seminar, via the responses of William Scott and Gregor Lang-Wojtasik in the plenary sessions, alongside points raised about the other presentations and workshops.


5.5 Critical challenges for indicators for ESD – William Scott

Scott offered the following critical challenges for ESD indicators, based on a review of the seminar presentations and discussions, and the main challenges around the idea of indicators for ESD.

First, Scott observed, the work of the UNECE EG, although of considerable technical merit in its scale and scope, is not, despite its title, focused on SD – or ESD; rather it concerns “policy, regulatory and operational frameworks [that] support the promotion of ESD”. Further, the documentation that the EG had produced at the time of seminar was generic rather than specific; if ESD is replaced by ‘health education’, and SD by ‘well being’, then the document still made perfect sense – apart from one reference to the Decade. Thus, in terms of an indicator specifically for ESD, rather than as a measure for strategy implementation, the documentation would seem to have little to offer.

Second, Scott argued that the UK government’s current SD indicator set lacks internal coherence. The juxtaposition of greenhouse gas emissions, fear of crime, dwelling density, and the need for people to consume five pieces of fruit and vegetables a day, were more a presentation of current government policy preoccupations than a coherent attempt to delineate – and indicate – SD, based on a clear and convincing model of SD. This was the politics of ‘no idea left behind’. The UK government also seemed to have lost sight of one of the inherent problems with indicators: where headline indicators remain broadly negative, we can tell that the overall position is not sustainable. However, the converse does not apply: when they are all broadly positive, we cannot be sure that the position is necessarily sustainable. Worse, it is possible that positive indicator results will operate to push us off a sustainable pathway.

Third, Scott suggested that Ofsted, in the form of Leszek Iwaskow’s input, has an implicit model of ESD: pupil participation, a global focus, links to community, an ethos of care (as in the DfES’s sustainable schools documentation), a focus on biodiversity, etc. – all of which has the feel of a good start on a framework for being a responsible educational institution in the 21st century. But, Scott argued, there is also a need for challenge, and the opportunity to think critically about issues, and about what others would have you think about them. Thus, there is a need in ESD to critically examine your own views, alongside those other than your own. What schools teach directly has to be important; so has what they teach indirectly through how they live, as institutions, in and with the world: i.e. how teachers teach and managers manage, and what is expected of children when care and compassion are simply not enough. In pedagogic terms, then, Scott argued, there is a need for a shift in tense and mood, from present instructional to future exploratory.

Fourth, Scott observed that Kim Walker and Stephen Gough had argued that: [1] SD necessarily implies a change in the models we use to live by, and [2] that any ESD programme worth its salt would challenge these models by asking questions about how we live – and might live. They said that we should try to ‘catch the change’ – the dynamic in the schooling process, and focus on the choices that schools have made in relation to change and to learning. Choices and change offer the possibilities of being a useful focus for a school-based indicator of ESD.

Fifth, Scott recalled that Graham Room invoked the idea of a rear view mirror as a metaphor for our limited view of the world (i.e. of SD) and our limited instrumentation. As Alan Reid had noted earlier in his tapestry metaphor for evaluating progress in SD112, we can only know our success and failure after the event; we are blind in the present. But we can also be blind in the past unless we have indicators (mirrors) that don’t distort (i.e. are accurate / timely / clear / etc) and are accessible. As Paul Vare had argued too at the seminar, many indicators obscure rather than illuminate, and any meaningful signal can be lost in the noise of communication.

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Sixth, Scott argued that there has to be merit in thinking about two kinds of ESD:

**ESD I** Promoting (informed, skilled) behaviours and ways of thinking, where the need for this is deemed important by experts.

“Examples include actions to be more efficient / less wasteful (e.g. less greenhouse gas). All this is ‘learning to be more sustainable’, and therefore ESD. This fits with the received view of SD as being driven by expert knowledge; here, the role of the non-expert is to do as guided with as much grace as can be mustered. This is Unesco’s view – by and large. It is what is driving the DESD.”

**ESD II** Building capacity to think critically about [and beyond] what experts say, and test out sustainable development ideas.

“Examples include thinking about what ‘being more sustainable’ means, and therefore is also ESD. This embodies a different view of what SD is. In this view, SD doesn’t only depend on learning; it is inherently a learning process. This leads to radically different definitions of SD.”

Each of these perspectives can lead to indicators, and in any discussion of indicators, such distinctions need to be respected.

**5.6 Measuring ESD: limitations and opportunities – Gregor Lang-Wojtasik**

Lang-Wojtasik’s comments identified important points from the prominent debates at the seminar and aimed to link these to the actual discourse of ESD, connected criteria, and ESD within a broader educational scientific view (e.g. BLK, 1998; Scheunpflug & Schröck, 2002; Lang-Wojtasik, 2003; Schreiber, 2005; Scheunpflug & Asbrand, 2006) 113.

The following table gives an idea of the key aspects raised by Land-Wojtasik:

<table>
<thead>
<tr>
<th>Challenges of indicators</th>
<th>Options</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normativity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where to link proposed effects?</td>
<td>Global justice and Sustainability</td>
<td>Questioning the paradigm of modernization and offering options to deal with complexity, uncertainty, plurality (including the possibility of social change to reach transformations in production and consumption) =&gt; more ethical</td>
</tr>
<tr>
<td>Modernity as an implicit norm</td>
<td></td>
<td>Improving the ruling paradigm of society without questioning the framing idea of industrialization =&gt; more embedded within theory of modernity</td>
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<tr>
<td>Learning and change</td>
<td></td>
<td></td>
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<tr>
<td>How to measure learning?</td>
<td>Learning as a causal process – “funnel of Nuremberg” (Nürnberger Trichter)</td>
<td>Deficit of technology: How to be successful in terms of intended learning processes concerning the causality of didactic-decisions, the liberty of learners, and the problem of rationality? (Luhmann &amp; Schorr, 1979; Luhmann, 2002) 114</td>
</tr>
<tr>
<td></td>
<td>Learning the treasure within – as a creative process</td>
<td>Universal model of learning: Is it possible to find a basic consensus of learning definitions? One possibility is given by the Delors Report (Delors, 1996) 115</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning as irritation of environment: How is it possible to foster individual processes of learning, which might lead to a capacity to deal with future challenges?</td>
</tr>
</tbody>
</table>

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113 All op cit.
## Challenges of indicators

<table>
<thead>
<tr>
<th>Sectors of education</th>
<th>Options</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dealing with which part of education-system?</td>
<td>Formal Education [FE], Non-Formal Education [NFE] and Informal Education [IE]</td>
<td><strong>Connection to universalized discourse:</strong> Three Tier differentiation makes possible a connection to the UNESCO consensus (EFA) and the possible definitions of different indicators. <strong>Clearer Responsibilities for education – GO vs. NGO</strong></td>
</tr>
<tr>
<td></td>
<td>Basic Education and Lifelong Learning</td>
<td><strong>Unclear distinctions:</strong> There are different understandings especially when it comes to the differentiation of NFE and IE (European understanding is not in all covering the UNESCO discourse) (Unesco 2005) 116</td>
</tr>
<tr>
<td></td>
<td>Pre-Primary Education, General Education, vocational education, Teacher Training, Higher Education, Adult Education</td>
<td>Necessary clarifications of relations between the “entry-ticket” to life” (Delors, 1996) and the perspectives of realizing lifelong-learning for all. Variety of requirements: Including all possible parts of education affords very different fields of subjects, methods, etc.</td>
</tr>
</tbody>
</table>

## Domain-specifics

<table>
<thead>
<tr>
<th>How to specify ESD within the general discourse on education and competencies (LSA)?</th>
<th>General field of activities</th>
<th>Problem orientation and generalized hope of possible connections to various education-fields/school as such</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning fields as part of ESD</td>
<td>Subject- or learning-field-specific: curricular formation of competencies within school-subjects or subject-fields</td>
<td></td>
</tr>
</tbody>
</table>

## Contexts

<table>
<thead>
<tr>
<th>Indicators for everywhere?</th>
<th>Nation vs. Nation</th>
<th>Variety: Various terms and understandings of indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>State vs. State</td>
<td>e.g. Germany – 16 federal states with different education systems =&gt; Diversity of possibilities</td>
<td></td>
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<tr>
<td>Regions vs. Regions</td>
<td>e.g. UK: England vs. Wales vs. Scotland vs. Northern Ireland (John Huckle) =&gt; Consensus through a National Action Plan</td>
<td></td>
</tr>
<tr>
<td>North-South &amp; East-West</td>
<td>EFA: Common sense internationally (enrolment, literacy-rates), difficulties to describe problems on a local level</td>
<td></td>
</tr>
<tr>
<td>Nation-States vs. Globalisation</td>
<td>World-Society as a reference-point: Linking the local, regional, state and national level to the construct of world-society (Luhmann, 1982, 1993) 117</td>
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Discussion

The introduction and background to this report traced the emergence of indicators in terms of their historical development, characteristics and functions within the fields of macro-economics, social policy and education. The report has also discussed the impact of new public forms of governance on social policy areas in the mid-1990s, and subsequent developments that have seen SD and ESD come out from the margins of (educational) policy making, coupled with attempts to generate indicators for both concepts during three successive waves of indicator initiatives. Following that, the report presented the content of the seminar contributions, alongside initial lines of critical response to perspectives, challenges and progress in indicators for ESD.

In this final section of the report, we draw together key themes from across the preceding sections, using discourse analysis techniques to identify areas for further discussion. The section starts with a brief introduction to the aims of discourse analysis, with illustrations in relation to discourses on ESD indicators, and then sets out seven key themes:

1. Clarifying the function(s) of ESD indicators
2. Indicators as normative goals
3. The depth of change, and how it is measured
4. Modes of governance and availability for indicators for different educational sectors
5. Institutional tasks for indicators at different educational system levels
6. Benchmarking and policy learning
7. Dynamics and innovation – the adequacy of indicators.

Discourse analysis

“The way that we use language is rarely innocent, and discourse analysis can help us to reveal how talks and texts are ordered to produce specific meanings and effects.” (Tonkiss, 1998:247) 118

Discourse analysis refers to a set of research approaches and techniques for investigating how a discourse constructs a topic and comes to govern the “way that a topic can be meaningfully talked about and reasoned about” (Hall, 2001:72) 119.

Throughout this discussion of ESD indicators, we can identify various indicator discourses at work. As Sterling noted in his discussion of thinking frameworks at the seminar, and as Mogensen and Mayer (2005) 120 argued in their comparison of different paradigms for ESD and its evaluation, a discourse promotes a particular vision of the world regarding such things as ESD and indicators, and how that version of reality might then be engaged with meaningfully, in relation to the model of that world and how this implicitly or explicitly underpins that particular discourse. Discourses then are the focus of our attention in this concluding section, in reviewing the seminar and the perspectives, challenges and progress in indicators for ESD found there, and in wider literature.

Thus, as was discussed in the background to this report, we note again that indicators have often been associated with macro-economics and statistics, but as the literature review and seminar presentations from England, Germany and the UNECE have shown, that is not the only way that indicators can be thought about or discussed, i.e. other epistemologies, methodologies and values

120 Mogensen & Mayer, op cit. See in particular, Chapter 2, Evaluation in EE and the use of quality criteria.
may highlight different aspects and tensions in the debate about ESD indicators, whether that be what constitutes an effective indicator, or why they should be used, if at all, within the ‘world of ESD’. In order to probe this further, Carabine (2001:288) recommends that discourse analysis considers ‘discursive strategies’, arguing that:

“A discursive strategy refers to the ways a discourse is deployed. It is the means by which a discourse is given its meaning and force, and through which its object is defined. It is a device through which knowledge about the object is developed and the subject constituted”.

Following this line of argument, we can suppose that if ESD indicators are only ever discussed in some particular ways and not others, for example, and as noted before, in relation to the technical and managerial challenges of developing a workable set of indicators, then what is perceived or understood as intelligible or legitimate for discussion in relation to indicators by a wide range of its stakeholders is likely to shift from an open to a closed set of topics, questions and issues.

To illustrate this scenario, regarding the broader literature for SD indicators, Bell and Morse (2003:57) have made the following observation:

“Projects geared to generating SD indicators tend to become myopically focused on technical issues (what indicators, how many, how to aggregate, etc) rather than really consider usage to bring about change. The result is a substantial literature that deals with methodological issues, but with little to say on how, or even if, the indicators were applied to help improve the quality of people’s lives.”

Returning to the notion of discourse research, Wetherell (2001:16) draws attention to the fact that, in the long run, situations such as this can have important effects on the social world, since:

“Accounts and discourses become available and widely shared, they become social realities and identities to be reckon within; they become efficacious in future events. The accounts enter the discursive economy to be circulated, exchanged, stifled, marginalized, or perhaps, comes to dominate over other possible accounts and is thus marked as the ‘definitive truth’.”

Here then, it can be said that discourse ‘works’ in a double sense: doing ‘work’ on the social world as it affects the shaping of it, but also requiring ‘work’ as the creation of one version of social reality, i.e. the active sense-making of a certain situation requires rhetorical and/or argumentative activity and effort. Wetherell (2001) goes on to suggest that discourse has both strong functional and constitutive effects, since certain rhetorical or argumentative strategies are often (more or less consciously) employed to produce a particular ‘effect’, i.e. to construe a persuasive version of social reality. Thus throughout this report we can note that the discourses around the DESD and UNECE in Germany and England have become powerful at national policy levels and in framing the debate, as shown in the contributions to the seminar, yet while it is likely that some may regard them as the ‘frame of reference’ and hence a ‘regime of truth’ about ESD (i.e. defining what counts as knowledge and a priority for indicators), the levels of acceptance and resistance to these discourses varies across the sectors and levels in each country, as illustrated by

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122 Mogensen & Mayer, op cit, is a good example of the plea not to exclude or discount socially critical approaches and possibilities for ESD and indicators, highlighting the work of the ENS project to promote holistic, teacher and student-centred, and learning-focused participatory forms of indicator development, e.g. through action research networks of schools across Europe.
the diverse contributions in Themes 1 to 5. In this sense then, some will want to swim against the ESD indicator tide, particularly as it is represented by the dominant discourses in this field.

To illustrate Wetherell’s argument further, one can imagine here that when the language of ESD indicators is strongly underpinned by the concepts and tropes of economics, neo-liberalism and managerialism, and when it appears naturally bound up with the implementation of ESD into formal schooling in most discussions on ESD indicators, it is then a suitable candidate for investigation by discourse analysis as this is where some resistance and opposition is found.

Nikel and Reid (2006:139) \(^{125}\) have already noted a corresponding observation for the broader field of ESD in Germany:

“that the terminologies of the ‘quality’, ‘efficiency’, ‘monitoring’ and ‘performance’ debates are slowly playing a more major role in the policy, positioning and the practice of … ESD in formal education”.

To examine this further via discourse analysis we have two options: one of the analytical foci in discourse analysis is aimed at reading ‘in tune’ with a text in order to look at what it is ‘telling’, while another similarly important approach requires reading ‘against it’ in order to detect its gaps, inconsistencies, ruptures, absences and silences (Tonkiss, 1998:258) \(^{126}\):

“At the same time discourse analysis often requires the researcher to read against the grain of the text, to look to silences or gaps, to make conjectures about alternative accounts which are excluded by omission, as well as those which are countered by rhetoric.”

Looking further at the raw material of seminar handouts, transcripts of discussions, and notes from the events, alongside the scope of the presentations and interactions at the event and the wider literature on ESD indicators, we can identify the following discursive features in the seminar discourses on ESD indicators:

1. There was a predominance of managerial terminology in the debates that construe indicators as a ‘necessity’ for formal education (for example, in terms of the logic and techniques of measurement and assessment, and for being taken seriously in the policy arena). This can be contrasted with less frequent attempts to position indicators as ‘possible’ tools to support the successful implementation of ESD into existing systems, in formal schooling in the first instance but also within informal and non-formal settings, with benefits to learning as the primary criterion for judging the value of ESD indicators and indicator sets.

2. There was a lack of specification and clarity when it comes to possible hesitations, inconsistencies and ruptures in discussion of ESD indicators, which here have the effect of ‘smoothing’ down and sometimes even eradicating emerging issues and oppositional discourses. Asking, *can proposed indicators be used for things other than for ESD; or are they largely interchangeable with other policy areas, as Scott raised in the discussion – and thus relatedly, what counts as an indicator that is specifically ESD-related and not generic* – all draw attention to these features of some of the current understandings and representations of ESD indicators in relation to their uniqueness and generality.

3. Gaps, absences and silences were noticeable around those elements of the discourse that construct and position indicators as ‘omnipotent’ and ‘ubiquitous’ in measurement and evaluation, and the silencing/silence of counter-discourses and considerations of alternatives to

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\(^{125}\) Nikel & Reid, op cit.

\(^{126}\) Tonkiss, op cit.
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indicators in the field of ESD. This is typically represented by the ways in which the discussion of ESD indicators is ‘normalised’ against the imperatives ascribed to particularly prominent understandings of ESD, namely, those associated with the DESD, and the UNECE Strategy, as the primary points for binding understandings together in these frameworks for ESD. It also appears in the proposed usage of indicators for ESD which focus on evaluating implementation strategies and progress rather than quality during the course of the DESD and in the early stages of populating UNECE indicator sets.

Given these features, we might assume there are possible distinctions to be made in referring to such tensions as those around ‘qualities’ and ‘indicators’ in the seminar debates. A warrant for this emerges in relation to a comment by one of the seminar presenters:

“...if the word ‘indicator’ is claimed exclusively by the mechanistic paradigm, let’s use quality criteria instead...”

Looking further afield, in their recent study on the scope, foci and methods of evaluation for ECO-salms, Mogensen and Mayer (2005:35) discuss a similar point, observing:

“the difference between ‘quality indicators’ and ‘quality criteria’, is not so clear cut. The difference does not lie in the use of the term ‘indicators’ or the term ‘criteria’, but in the implicit or explicit values accompanying them and in the procedures in line with the stated values”.

At first sight, Mogensen and Mayer’s identification of a missing ‘natural’ distinction between ‘indicators’ and ‘criteria’ is obvious, and the seminar presenter’s suggestion common-sensical. Additionally, both are in accord with Room’s statements outlined in Theme 1, and Sterling’s in Theme 2. However, we should note that indicators, while being ‘innocent’ per se can be considered less so by bringing to mind their history and historical context (see the Background). In this respect, we note Mogensen and Mayer (2005:32) remark earlier on in their report that:

“The term 'quality indicators' is an ambiguous one and tries to reconcile two views of the world, two paradigms: one term, ‘indicators’, that derives from the positivist paradigm and that generally refers to statistics and standardised procedures, is related to another term, ‘quality’, that originally refers to another paradigm, to other needs and to another value scale. While there is a desire not to forego quality, there is also the attempt to reduce it once more to numbers and quantities. This tendency may, however, be reversed by trying to “qualify data and statistics” and by using indicators as traces, as clues, within a consistent value system, employing mediation and negotiation procedures that refer to the socio-critical paradigm.”

That is, while indicators can – potentially – be used within different paradigms, as Sterling and Mogensen and Mayer all argue, they still carry some baggage in terms of their history and paradigm associations, as illustrated by their discursive effects and features that distinguish one from the other. Thus, there is a need to consider an indicator’s roots as an evaluative tool in economic modelling, and how this can either ground them in or associate them with a particular worldview about measurement and what is measureable in the expert’s and wider public’s perceptions. A tendency to use ‘managerial terminology’ as illustrated above might signal this discourse, linking indicator discourses largely with strategy evaluation and technical considerations, but also with particular indicator criteria in such a way that then governs what counts as the value of an ESD programme. Again with reference to Mogensen and Mayer (ibid.) we note their own attempts at discourse analysis around these issues:

127 Mogensen & Mayer, op cit.
“The main reasons for this interest in indicators are not only ... the need for ‘control’ together with market pressures – but also the need, imposed by a knowledge-based society, to take the various education systems to the same level of results and thus to compare education systems, curricula and the increasingly more autonomous and differentiated schools, not only within a certain country, but within federations like Canada, the United States or Australia, and by now even at European level.”

However, rather than try to identify or adjudicate the drivers here, we might be better placed to consider the possible tensions arising from poorly-defined or misuse of language and terminology in the blurring or hybridising of worldviews (i.e. underpinning values and assumptions) within the debate. As Room and Rode both warned, this may weaken the actual design and perception / reception of some indicators. That is, while there is vast functional potential often attributed to indicators and related to this a breadth in their design, as the tensions in the discource show, they cannot be all things to all people simultaneously: i.e. aiding measuring, benchmarking, monitoring, communicating information, learning, providing orientation knowledge, steering information, capacity building, accounting, funding, resource managing, decision-making.

Thus, like Sterling in Theme 2, Mogensen and Mayer (2005:40) have juxtaposed two paradigms for evaluation, where the terms shift in emphasis according to the paradigm 128, to illustrate where the tensions might be located for the field, and where the paradigms might prove incommensurable:

<table>
<thead>
<tr>
<th>Reference context</th>
<th>Quality indicators (criteria) in a positivistic paradigm</th>
<th>Quality criteria (indicators) in a socio-critical paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The specified frame of reference is considered to be objective and valid for everyone. Its inspiring values are generally not specified.</td>
<td>The frame of reference is specified together with its inspiring values; awareness of the existence of other points of view is evident.</td>
</tr>
<tr>
<td>Characteristics of indicators / criteria</td>
<td>The indicators are either quantitative data or observable phenomena that are operationally defined.</td>
<td>The criteria are general descriptions of characteristics explicitly derived from reference values. An indication of observable facts consistent with the criteria is only exemplificative.</td>
</tr>
<tr>
<td>Procedures for their definition</td>
<td>The indicators are established via essentially top-down procedures.</td>
<td>The criteria are defined via both topdown and bottom-up procedures, and require stakeholder participation.</td>
</tr>
<tr>
<td>Procedures for their ascertainment</td>
<td>Once the indicators are established, they are ascertained through sector experts. No negotiation procedures are envisaged.</td>
<td>Once the criteria are negotiated and agreed, the stakeholders turn them into ‘observable’ or ‘documentable’ indicators. Evaluation is still both internal, by the stakeholders, and also external. The external evaluator is often a peer group member.</td>
</tr>
<tr>
<td>Evaluation report</td>
<td>The results and interpretations of the evaluation via indicators are established by the group responsible for the evaluation.</td>
<td>The results and interpretations of the evaluation via criteria are agreed between the internal and external group of evaluation.</td>
</tr>
<tr>
<td>Expected results</td>
<td>Classification and selection of initiatives, programmes or schools, in line with the established indicators. The possibility of benchmarking between the various initiatives.</td>
<td>Stakeholders’ awareness of the quality achieved with reference to the starting values. Orientation with respect to the changes still necessary. Exchange and comparison between different experiences.</td>
</tr>
</tbody>
</table>

128 See also Coleman, who discusses the misuse of both terms in relation to qualitative and quantitative indicators. Coleman, V., 2002. Qualit,y indicators versus Qualit,y Criteria: reviewing approaches towards the evaluation of education for Sustainable Development. Sydney, Australia, Graduate School of Environment, Macquarie University.
A second example of the consequences that can arise from particular discourse strategies is to consider the notion of ‘tighter coupling’ as a preferred option in the German scenario for ESD indicators. Pintér et al. (2005:30) have illustrated the possible implications of ‘tighter coupling’, arguing that doing this runs the risk of conceptual narrowing and a favouring of a conceptualisation of SD that is overly in accordnace with the ‘existing’ data and the models that SD indicators are then required to be linked to. Critics might regard this as akin to the domestication and neutering of ESD, supporters might point to its mainstreaming and acceptance. However, for both interpretations, Pintér et al. identify a key issue around “assuming that key actors of SD are willing to compromise” (ibid.), through reference to their SD indicator scenario, ‘Synergy world’, which describes the linking of SD indicators to existing data such as those for the Millennium Development Goals. In this regard, it has to be asked what would be the implications of the formalisation of linkages such as these, in terms of whether ESD is largely indexed to the existing formal education system and its evaluation, or for that matter, as a tool for delivering SD, as Vare notes, or Iwaskow prefers, for example? Would this possibly be to suggest that it should become ‘normal’ for ESD ‘to play the game’, perhaps play two games (education and SD) simultaneously? And, given this scenario, how would silence about this in the public debate about indicators contribute to/ prevent / open debate on the place of ESD in mainstream education and SD?

The distinctive enfoldings of the ESD indicator discourse that help illustrate such questions further can be identified in the debates around the various indicator sets, particularly in terms of the purposes and functions attributed to them in the specific indicator initiatives. For example:

1. The overarching UNECE strategy is a high-level policy initiative, and can be understood as geared to: (i) the satisfaction of powerful constituencies in relation to the DESD and EU strategy, (ii) the establishment and achievement of ESD’s legitimate position and reputation within formal, informal and nonformal education, and (iii) promoting the reduction or absence of problems and troubles in implementation through the careful and wise use of indicators. However, as noted above, there seems some hesitation regarding how the EG’s work relates to the quality and variability of national educational provision in general and progress towards SD in particular – by attempting to decouple the latter from the ESD indicators (which can substantially weaken its policy position and credibility), and by suggesting that in terms of the former, self-assessment and regional variation will be factored into indicator sets but these are not included in the reporting framework’s calculations (see the EG Guidance for Reporting).

2. A different picture emerges from the contributions about England where different discursive configurations are to hand regarding indicator purposes and functions. While from the national government’s side the initiative appears to focus more on conformance with external goals and specifications regarding SD strategy and the school inspection system, there is a ‘counter-discourse’ advocated by academics and practitioners which prioritises fruitful learning processes at a local level in terms of the purpose of developing and using an ESD indicator, as Huckle’s and his compatriots experiences show. The ‘order of the discourse’ in terms of the possibilities it generates for ESD indicators seems to be particularly interesting here as it is (perhaps) not yet clear how powerful this counter-discourse will become at the national level and in relation to engagement with the work of UNECE, e.g. in regard to decision-making in terms of focusing solely on one ESD indicator officially at a political/policy level for SD, or for a set of indicators complementing, drawing on and perhaps developing the UNECE set. More generally, this situation invites us to consider the possibilities of how power is distributed at national levels in relation to the ESD indicator discourses.

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119 Pintér et al., op cit.
120 Material in this section draws on Müller, S., 2006. Comment and critique on (examples of) the current debate on ESD indicators – a Foucauldian Discourse Analysis. Unpublished Masters dissertation, University of Bath.
3. The situation in Germany presents perhaps the least coherent or radical response to the tensions, as while there are calls for tighter coupling, aimed (possibly) at the achievement of ESD's legitimate position and reputation, and / or the conformance with external goals and specifications (e.g. in tying indicators to current work on meeting educational standards), this correspondence with and allegiance to an existing 'regime of truth' reifies rather than challenges existing knowledge/ power relations between ESD and educational policy in Germany. Yet, perhaps, this might also be where ESD is seen to enhance and broaden educational standards, as an evolutionary rather than revolutionary approach to ESD implementation?

Finally in this part, issues addressed across the report’s section are identified for further consideration under seven broad headings.

**Discussion Themes**

I **Clarifying the function(s) of ESD indicators**

The seminar event showed a lack of clarity and agreement over the preferred functions of ESD indicators and evidenced the multiple viewpoints and expectations associated with the various ESD indicator initiatives. Broadly speaking, we can identify three major lines of thought regarding the functional role of current ESD indicators at the seminar.

First, there was the traditional policy-making role in which indicators are used to: (i) compare national performances; (ii) illuminate (and encourage stakeholders to consider) some of the trade-offs; (iii) help the public to control politics (democratic accountability); iv) help countries to see and learn lessons from each other (cross-national benchmarking) (exemplified by Room’s presentation).

Second, there was the role related to accountability and the effectiveness of innovation / programmes / interventions. Referring to the work of the UNECE Expert Group, Scott noted this kind of work, “although of considerable technical merit in its scale and scope, is not, despite its title, focused on SD – or ESD”; rather it concerns “policy, regulatory and operational frameworks [that] support the promotion of ESD”.

Third, there was the role for ESD indicators in sustainable organisational development and learning. One way to interpret this is that the role of the indicator set is “to gather information that helps to steer knowledge-based, local or regional initiatives towards developing their own sets of criteria” (Bormann). This is in line with Rode naming ‘dissemination and comprehension of the concept of Sustainability / ‘Gestaltungskompetenz’ as the basis for further dissemination and implementation’, and ‘self-evaluation of educational institutions and educational measures’, along with ‘measurement of progresses concerning dissemination and implementation (transfer)’, as the “most relevant [indicators] that are suited to promote a stabilisation of ESD”.

This variety of expectations of indicators raises a series of open questions:

a. Is it helpful to call each of them an ‘indicator’, as opposed to, say, quality criteria or standards?

b. Do these differences provide us with further insights into the reasons behind current indicator development initiatives in ESD, why they are considered necessary, and their purpose(s)?
The appraisal of an indicator is shaped by its assumed function in relation to the system and model that underpins it and the characteristics that come with it, as set out in the final part of the Introduction. Within current thinking about their function in relation to policy making, indicators are appraised against:

1. the extent and quality to which the indicator capture intervening dynamic processes;
2. how well the underlying models are articulated;
3. the clarity of goals;
4. the clarity of modes of governance and compliance; and
5. continuous reflection on whether the indicators are or remain ‘fit for purpose’.

It remains an open issue as to whether the five points continue to be important appraisal criteria in relation to the other indicator roles, be that only partially, or not at all, and whether they determine the nature, quality and extent of the indicators used for ESD. Three main challenges here are that:

I. indicator data can be misread / misinterpreted by policy makers and the public (e.g. in working with “rear view mirrors”);
II. indicator data can provide a different account to the public’s daily experiences of the phenomena; and
III. the intensity and direction of the effect / impact of indicator(s) on (ESD) practice is not always transparent within a system of proxy measures.

These points curtail the suitability and confidence that can be placed in indicators to measure and monitor change and implementation strategies.

2 Indicators as normative goals

The issue of normativity can be addressed from two starting points: on the one hand, by exploring the role of normativity in the process of indicator development; and on the other, its role in interpreting information generated from indicators.

Firstly, if indicator development is perceived as a normative endeavour through the setting of reference points and the establishment of system values, an obvious question to ask is, what power struggles take place between competing positions and how are decisions finally made. For Room, indicators and their development process are variously shaped or underpinned implicitly or explicitly by a model of economy and society. A model has a set of economic and social goals and a mode of governance/coordination/compliance, and consequently the indicator development process will be influenced by the struggles between lobbyists and proponents of competing models and expectations about the goals and modes.

Gough addressed this theme at the seminar via a discussion point on: Why is it so difficult to ‘sell’ ESD and a sustainable society? Gough argued that ESD questions established models of economy and society with its focus on earning money and consumption [cf. the goals of SD in ‘The emergence of indicators for SD’]. The difficulty in this area for social and environmental policy making lies with its tone of indicating ‘it is time to give things up’. It is captured in the question common to SD discourse, what are we individually and collectively ready to give up for SD to happen? (Although it may be weakened by the promotion of the notion of ‘sustainable consumption’.) It can also be phrased in terms of discussing and being aware of possible costs and losses to be incurred by taking on the ESD agenda, which may mean, at some stage or other, having to opt out of other agendas, or dealing with how ‘economic competitiveness’ and ‘collaboration’ are involved in order to reach social goals.
It can also be noted here that conventional economic analysis focuses on growth and stability. For example, both are at the core of the EU Maastricht treaty, and continue to be key objectives within the Lisbon strategy. However Room et al. (2005:143) 122 have also noted that the Lisbon strategy added “dynamic learning and innovation” to the key economic objectives, as these are needs and requirements for a knowledge-based economy:

“… in order to develop a knowledge-based economy, the member states of the EU would need to accelerate the transfer of technological and organisational know-how from the best performers to the rest of the Community. Benchmarking provides intelligence about different national experiences, it enriches national debates and it enables political and economic actors on the ground to drive the process of comparison and policy learning, depending on their specific needs and interests.”

Thus, given that indicator development cannot be separated from questions about modes of governance, an interesting issue here is, how much of the discussion about indicators is technical and how much of this is political, i.e. essentially about addressing modes of governance, coordination or compliance (e.g. via neo-liberalist policies)?

Second, normativity can play a role in interpreting results and findings generated by the indicators. Again we note Gough addressed the notion of indicators ‘indicating’ whether progress has been made on the path to something desirable. To make the point that indicators have limits in this task, he used the example of the uses, effects and interpretations of indicators in crime reduction policies. He pointed to the observation that, while ministry officials and statistics can indicate a decrease in crime levels, people can be surprised by this as their personal observations and experiences do not necessarily tally with the statistics or conclusions. At the heart of the differences lies one’s perception about what constitutes a crime. Therefore, it is important to consider how key concepts such as ‘crime’ are operationised in indicators. Similarly, we can ask, what are the key concepts in the ESD indicator projects? How is ‘ESD’ defined? Who defines it? And in whose interests is it so defined?

3 The depth of change, and how it is measured

“When the success of the family planning program in India was measured by the number of intra-uterine devices (IUDs) inserted per month, some family planning workers, it is said, inserted IUDs in unknowing women, in infertile women, and even in women who already had IUDs. The indicator looked fine, but the birth rate, the actual target, was hardly affected.” 123

This theme and opening quotation invites us to consider the depth of change which the indicator will measure. Key issues relate to ‘performativity’ and ‘quality development’ in ascertaining whether endemic change has occurred.

Stephen Ball (1998, p.190) 134 has analysed how British educational policy ‘works’ and ‘works upon’ education and teachers by using the concept of ‘performativity’, in the following situations:

• as a disciplinary system of judgements, classifications and targets toward which schools and teachers must strive, and against and through which they are evaluated (e.g. discourses of ‘standards’ and ‘quality’)

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123 Meadows, op cit. p.3.
by providing sign systems that represent education as a self-referential and reified form for consumption (e.g. concepts borrowed from commercial settings, such as ‘total quality management’, ‘human resource management’, etc.)

by residing in the pragmatics of language, such as in the enunciative effects of ‘educational management’ and being part of the ‘effective schools movement’, exemplifying an instrumentalised rational orientation to institutional life.

There are multiple responses possible here, addressing the question of whether indicators tend to work or are to be interpreted within a performativity discourse:

1. Within the ESD indicator development initiatives, the debate on this issue appears to focus on what counts as quality evaluation. It can be argued that a shift is required from measuring products to measuring processes and consequently there is a case for augmenting quantitative indicators with qualitative ones: acknowledging the importance of other forms of evaluation such as examples of good practices via rich descriptions. The main slogan here is: from ‘accountability to evidence based quality development’ (cf. Mayr & Schratz, 2005) 135.

It can be questioned whether this approach represents a different mode of thinking about the role of policy-making and the way it influences practices, or whether this is more a case of changing vocabulary.

2. A different take on the issue arises from critical reflection about the way we engage in discussions and how we reflect or evaluate the discussion on indicators (i.e. at a ‘meta-level’ of thinking about the process of engaging in discussions), and whether this can be opened up, integrating all the stakeholders of ESD and the indicator debates in such a process?

An interesting question to start with therefore, is, ‘What alternative stories about ESD and ESD indicator initiatives can we tell to support engagement / commitment (for debating / reflecting and changing practice) … to weaken resistance to the initiatives?’

For example, alternative ‘stories’ might be created or differentiated by responding and responding differently to questions such as ‘what does the story about ESD indicators say about’:

- reason for innovation
- ownership of innovation
- consequences in case of resistance, dismissal of the adoption of (the idea of) indicators by people and institutions
- possible costs and loss to be made by taking ESD agenda (e.g. by opting out of the agenda)
- uncertainty about the outcomes
- previous success and failure stories of other educational initiatives/reforms.

4 Modes of governance and availability for indicators for different educational sectors

Education in relation to Agenda 21 was organised around the issues of:

- universal access to basic education;
- reorienting education towards sustainable development;
- increasing public awareness; and
- promoting training.

135 Mayr & Schratz, op. cit.
Looking across the four objectives, it can be noted that from the top to the bottom, the influence of the state decreases, and with it the availability of data and the quality of the data (owing to a broader range of providers in the sector) become more critical issues, as observed by Apel.

In terms of availability of data a crucial question for the formal sector is whether it is necessary to establish newly generated statistics for an ESD indicator, or better to tap into and use already available statistics (e.g. school statistics)?

Apel highlighted the problematics for the informal sector regarding the availability of shared definitions on key terms such as ‘informal learning’ and the lack of systematically gathered data in relation to ESD activity in the informal and non-formal sectors. In other words, while for education provided by the state, statistical and evaluative procedures are often in place and familiar within school management, this is only the case to a minor extent with the variety of providers of education in the informal setting. This raises questions not only about the availability of data for other sectors but also about quality, and the feasibility of gathering such data there.

The informal sector has seen the promotion of notions of ‘networking’ and ‘partnerships’ between various bodies from the sector (see also Goals for the DESD). For example, in the UK, the Sustainable Development Education Panel (Defra, 1999) identified the Youth Service as “a real opportunity to reinforce” ESD and encourages partnerships of “Government and appropriate bodies from the sector to define specific learning outcomes unique to education for sustainable development and give encouragement and support to Local Authority Youth Services and National Voluntary Youth Organisations to enable them to conduct all their activities sustainably”. It is recommended that “all youth providing bodies monitored by the Office for Standards in Education to monitor the outcomes of education for sustainable development, both in terms of knowledge, understanding, attitudes and behaviour”.

5 Institutional tasks for indicators at different educational system levels

As Rode showed, a typical differentiation of levels in the education system is:

- The macro-level (policy-making) - at this level, societal and political decisions are made that form the context and the frame for all ESD activities. It includes the implementation of ESD in curricula and framework plans, the provision of sufficient resources, and the involvement of ESD in general decisions in educational policy. Another example is the organisation of cross-institutional networks and supporting systems.
- The meso-level (institutional / organisational) - This level comprises the different educational institutions; that is, general education schools, vocational schools, institutions of higher education, institutions of further education and institutions outside the formal sector (environmental centres, adult education centres, etc.).
- The micro-level (classroom / school interaction level) - this is the place where individual educational measures with their planning, realisation and results are found.

Currently, multiple viewpoints exist on how ‘indicators’ (commonly used in the macro level) are related to and integrated with those at the meso and micro levels (e.g. in the seminar contributions by Huckle, Iwaskow, Bormann, and Rode). Broadly speaking the viewpoints range from ‘indicator and indicator development as learning activity in the curriculum’ (de Haan & Harenberg, 1999) creating indicators on a macro level that “help to steer knowledge-based,

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local or regional initiatives towards developing their own sets of criteria" (Bormann), and the development of an indicator system in which indicators are sought for each level (Rode).

A key issue here is the question of whether there should be distinct differences between policy-making and practice and hence indicators at the different levels of the education context and whether a traditional policy-making tool can be applied within a different field and across levels meaningfully. For instance, is it merely desirable or is it necessary that stakeholders at the local level (e.g. teachers) see a connection between micro-level indicators and macro-level ones and vice versa, e.g. in terms of their influence, impact, direction of flow and consequences for each other? Differences in policy making at the various levels have been pointed out be Taylor (1973) (see Hammersley, 2002:64), and the difficulties they can create 138:

"... Taylor does not believe the problem lies in an uneven distribution of knowledge that could be easily remedied. He sees the situation in much more dynamic terms. He argues that: 'As part of the process of exerting identity, each of the education professions and sub-professions tends to develop its own language and style of expression, to legitimize certain sources of knowledge and to devalue others' (Taylor, 1973:195).

“And these distinctive languages … make it more difficult for individuals from different groups to ‘take on the role of the other’, and inhibit understanding and the development of shared meanings between such groups. Not only this, but the tendency to perceive the world in the terms of a particular specialism has the effect of shaping the very nature of the reality with which the individual sees himself as having to contend. (Ibid.:204-5)”

Given this, an interesting question opens up in relation to applying an action research approach at the meso and micro level. An indicator in this sense could be measured in terms of “the percentage of learners who have successfully taken part in action learning designed to explore ways of creating a more sustainable society”. In more detail, an action research project (in which action learning is assumed to be happening) focuses on an issue in the school (college/university) and/or community (near and/or far) that allows learners to develop and refine their own definitions and indicators of ESD and determine what knowledge, skills and values are appropriate to realising such development.

A tension here relates to whether it is possible and desirable to measure educational processes and outcomes, to initiate change of practice, to control schools / school performance / learning outcomes with indicator, or to control it at all, through these kinds of indicators at these levels?

The common conceptual structure of the indicator system that is usually used regarding action can be broadened through the action research indicator concept. It appears to show more respect to the autonomy of schools and their right to report and monitor their commitment and improvements in their own terms regarding ESD (cf. Mogensen & Mayer, 2005). This kind of indicator promotes the empowerment of individuals and schools as small communities to measure and decide on their improvement.

However, while accepting the function of indicators and that the use of action research indicators may play a role of enriching and encouraging sustained conversations about ESD, indicators remain proxies, and despite their successes, will fail to capture completely all the complicated processes happening in relation to ESD; particularly with action research indicators being limited to the micro and meso levels.

6 Benchmarking and policy learning

The current ESD indicator development initiatives as far as they have been presented lack attention to whether and how the benchmarking process is used in relation to the indicator set.

Benchmarking can be done in many different ways and its relation to policy and learning can be interpreted differently. For Room the simple and mechanical approach to benchmarking, e.g. by reference to checklists of indicators (cf. the first phase of the UNECE indicator sets), is unhelpful in relation to understanding drivers of ‘innovation’ and learning. Instead, ‘bench learning’ through benchmarking expands the importance of benchmarking towards (Room et al., 2005:143):

- providing intelligence about different national experiences,
- enriching national debates, and
- enabling political and economic actors on the ground to drive the process of comparison and policy learning, depending on their specific needs and interests.

This provides a different perspective on the value of indicators, as usually benchmarking is considered as a process within policy learning and the emulation of best practice. In other words, it requires measures to ensure that benchmarking is accompanied by ‘bench-learning’. For Room et al. (2005), this means that benchmarking involves sharing and exchanging (in workshops and databases) “narratives, case studies and ‘stories’, which integrate these indicators into coherent accounts of how change practically occurs” (Room et al., 2005:144).

Behind this is a critical view of benchmarking and identifying ‘best performance’ as a methodology that promotes imitation rather than diversity. The latter is seen by Room et al. as more productive in terms of future innovation. For benchmarking to serve the purpose of benchmarking and fostering diversity a different approach to comparison is required. Room et al. call this ‘benchmarking for political choice’ (p.145). In this view, comparison intends to “provide national policy makers with an array of different scenarios of potential development” as selected indicators reveal the ‘trade-offs among alternative outcomes’ (p.145). Preconditions for policy learning in this ways are:

- stronger consideration by the public on what happens elsewhere by exercising national policy scrutiny
- a powerful commitment to good governance on the part of the national and regional political institutions (“community interest in how that national responsibility is exercised”) (p.148).

7 Dynamics and innovation – the adequacy of indicators

Room et al. elaborate criteria to judge the suitability of indicators of an innovation process. They state that most of the indicators in general use focus on “the spread of a given innovation across the population in question” for monitoring the development (Room et al., 2005:136); alongside further details such as capturing aspects of diffusion and impact, and its spread to even the most ‘backward’ regions. Yet Room et al. also emphasise a second important type of indicators, that of indicators of the ‘leading edge’. These are indicators or sets of indicators that capture “the way in which enterprises, public services and maybe whole nations are able to capitalise on one wave of innovation in order better to exploit the next wave, thereby remaining at the forefront of successive waves of change” (Room et al., 2005:136).

It can be doubted that this has been considered or reflected within current ESD indicator initiatives. It is also worth considering whether innovation journalism is significant for ESD indicators, in that public awareness of innovation is an important part of the innovation process.
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