



## Introduction

### **Getting out of the confusion of E-, S- and D-competencies**

by Sanskriti Menon and Thomas Hoffmann

Two teacher trainers are standing on the veranda of a university compound when you pass by and overhear their conversation: 'I am glad that the idea of Environmental Education has been widened and now we talk about Education for Sustainable Development', one says. The other responds, 'I do not agree with you, because we had a clear understanding of Environmental Education-competencies to be developed and now we start getting lost in a range of Sustainable Development-competencies. I think that learners will only acquire them if their teachers possess solid competencies in Education for Sustainable Development.' Do such confusing discussions sound familiar to you?

With this short article, we would like to clear up the confusion by answering five crucial questions:

- What are competencies?
- What are EE-competencies?
- What are SD-competencies?
- What are ESD-competencies?
- How do I achieve competencies?

#### **What are competencies?**

The discussion about competencies is a discussion about the aims of education. Is the aim of education only to transfer information? That would mean that teachers confront learners with a collection of facts, which are more or less interlinked and form the individual basis of understanding. Or should education lead to the empowerment of individuals to cope with current as well as future challenges that life offers, putting them into situations in which they have to act and find solutions to the given problems much more on their own. These thoughts bring up the question: What is the role of schools in a society?

Schools have the task to help each generation acquire basic knowledge and understanding of their present time and contemporary life based on our collective history and traditions, our values and cultures. Similarly, we have to agree that education and school have to prepare each generation for their own future. That means that our perspective as teachers has to be threefold: related to the past, present and future. We cannot ignore even one of these time dimensions! We should not limit our efforts to educate about the past or for the present, but should integrate expected and prognosticated developments related to the future. While being aware that present and future are never static, but in permanent change, we have to analyse and understand our presence to be able to teach in the right way.

Our present times are dominated by two big processes: the degradation of the environment and globalisation. While the first endangers our living conditions, the latter in its current form very rapidly changes our economic and social lives to the benefit of some and the disadvantage of many. If school has to prepare students for their future lives, we have to accept that we cannot do so using traditional schooling practices that were developed under totally different conditions.



Therefore, education should lead to the empowerment of individuals to cope with the current as well as future challenges that life offers, placing students in situations in which they have to act and find solutions to the given problems much more on their own.

The latter implies that education is far more than a certain amount of facts and linkages - it is the ability to act on the basis of knowledge. This requires a fundamental change in teaching methods. Schooling has to change to coaching, and learners need to be given tasks or opportunities to explore their own spaces of experience, making them use learning methods that strengthen their autonomy as well as their self-confidence.

Joseph Leisen, a German physics didact, puts it in a very short formula-like definition, saying 'competence means acting with the use of knowledge'. That means that the educational concept of competencies is not suggesting that students be taught fewer facts, but suggesting that students learn how to use facts in making decisions about their actions. The learners are not only asked to repeat facts and aspects they have learned by heart, but are challenged to apply their knowledge in given situations.

Next, we question the adequacy of Leisen's statement that competencies mean 'acting with the use of knowledge' and suggest adding the words 'and values'. If we restrict our understanding of competencies to the use of knowledge, we disregard that education is and has always been connected to cultural as well as time-specific values.

According to the global challenges mankind faces and according to the concept(s) of Education for Sustainable Development, the values to be considered are therefore connected to the principles of sustainability: global as well as local social responsibility, respect towards nature, reducing disparities in living standards, peace, and respect for diversity. Considering this, we could state: Competence is the ability to apply knowledge guided by values, including the readiness of the individual.

### **What are EE-competencies?**

Environmental Education (EE) gained international recognition in 1972, when the United Nation Conference on the Human Environment in Stockholm, Sweden, highlighted Environmental Education as the means to address environmental issues worldwide.

The recommendations from the first Intergovernmental Conference on Environmental Education, in Tbilisi, Georgia (in the then USSR), organised by UNESCO in partnership with UNEP in 1977, highlight the important role of EE in the preservation and improvement of the world's environment, as well as in the sound and balanced development of the world's communities. Subsequent conferences on EE by UNESCO and UNEP have helped evolve an international strategy for 'action in EE and training' (in Moscow in 1987) and highlighted the role of education and public awareness for achieving sustainability (in Thessaloniki, Greece, in 1997).

According to UNESCO, 'ESD has its roots in EE. The founding documents are the Tbilisi Declaration (for EE) and, for ESD, Chapter 36 of Agenda 21, on education, public awareness and training. ESD is intended to build on the lessons of EE, not simply perpetuate EE under another name.'

The Tbilisi Declaration provides a general set of goals, objectives and principles for environmental education. The objectives refer to enhancing the students' awareness of and sensitivity to the complete environment and its connected problems, and helping them develop attitudes, values and feelings of concern for the environment, helping students acquire the skills for identifying, investigating and solving environmental



problems. Furthermore, they refer to participation and active involvement at all levels in working toward the resolution of environmental problems.

The North American Association for Environmental Education (NAAEE) has recently developed a Framework for Assessing Environmental Literacy. This puts forth seven competencies for learners, including the ability to identify, analyse and investigate environmental issues, evaluate and make personal judgments about environmental issues, use evidence and experience to defend positions and resolve issues, and finally to create and evaluate plans to resolve environmental issues.

The following table shows the UNESCO teacher competencies on EE on the one side and the NAAEE competencies on environmental literacy on the other side, documenting the development of the discussion within the EE-process as well as the necessity to consider both levels of competencies: the learners' as well as the teachers' ones.

**Table 1: UNESCO teacher competencies on EE and NAAEE competencies on environmental literacy**

<p style="text-align: center;"><b>UNESCO (1996)</b></p> <p style="text-align: center;"><b>Learning for a sustainable environment - A competency-based framework for teacher education in environmental education</b></p>	<p style="text-align: center;"><b>NAAEE (2011)</b></p> <p style="text-align: center;"><b>Developing a framework for assessing environmental literacy</b></p>
<p>An effective environmental educator is characterised by:</p> <ol style="list-style-type: none"> <li>1. an appreciation of the urgency of introducing environmental education into the curriculum;</li> <li>2. an awareness of historical development of environmental education;</li> <li>3. an awareness of environmental education as a cross-curricular theme;</li> <li>4. an understanding of the philosophy, characteristics and goals of contemporary environmental education;</li> <li>5. an understanding of the differences between environmental education and environmental studies;</li> <li>6. an understanding of and commitment to the three-fold approach of education in, about and for the environmental education;</li> <li>7. the ability to adapt and develop the competencies in:</li> </ol>	<p>Competencies are clusters of skills and abilities that may be called upon and expressed for a specific purpose.</p> <p>These include the capacity to:</p> <ol style="list-style-type: none"> <li>1. identify environmental issues – including the ability to describe and provide evidence for the dimensions of the issue, human disagreements central to it, and factors that cause or contribute to it;</li> <li>2. ask relevant questions – about environmental problems as well as human dimensions and historical or geographical features of an issue. This also includes the ability to ask higher-order questions aimed at discovering conditions that have implications for the issue;</li> <li>3. analyse environmental issues – the interpretation and use of knowledge regarding physical, ecological and socio-political systems, and of information about stakeholders, their positions, beliefs and value perspectives. Also, this includes the ability to determine relevant factors and to discern interactions</li> </ol>



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<ul style="list-style-type: none"> <li>• knowledge and understanding of environmental issues and problems,</li> <li>• critical thinking abilities,</li> <li>• environmental values and attitudes,</li> <li>• environmental action outlined above;</li> </ul> <p>8. the ability to establish the relevance of their subject specialisations to environmental education and how subject teaching can be enriched through developing this link;</p> <p>9. the ability to develop values clarification and integration with students;</p> <p>10. the ability to plan, deliver and assess issue-based learning;</p> <p>11. the ability to introduce a variety of environmental dimensions (e.g. social, economic, political, historical, cultural, aesthetic, physical and biological) and environmental perspectives (e.g. women and indigenous peoples) in the curriculum;</p> <p>12. the ability to discuss environmental fears and feelings with students;</p> <p>13. the ability to introduce and assess the action-oriented component of environmental education;</p> <p>14. the ability to employ a variety of teaching and learning styles to achieve environmental education goals, including individual to whole class learning; active to passive learning; co-operative to competitive learning; disciplinary to interdisciplinary learning; and include activities such as games and simulations, fieldwork, issue investigations, case-studies and action research activities;</p> <p>15. the ability to develop environmental education in outdoor settings;</p> <p>16. an awareness of the contributions of the hidden curriculum in achieving environmental education goals;</p>	<p>among those factors, and to predict likely consequences of issues;</p> <p>4. investigate environmental issues – by gathering new information about an issue as well as locating and using relevant sources of additional information, synthesising, and communicating the outcomes of the investigation.</p> <p>5. evaluate and make personal judgments about environmental issues – constructing dispassionate evaluations and explanations based on available information and the beliefs and values of stakeholders, and articulating views about actions that may be warranted. Critical thinking is at the core of this competency;</p> <p>6. use evidence and experience to defend positions and resolve issues – constructing and defending a sound evidence-based argument about what it will take to resolve or help resolve an issue;</p> <p>7. create and evaluate plans to resolve environmental issues – by assuming the responsibility for acting, frequently with others, and engaging in planning based on the environmental conditions, available resources, and socio-political contexts to resolve or help resolve issues.</p>



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<p>17. the ability to critically evaluate environmental education teaching and learning through the use of a variety of assessment approaches;</p> <p>18. the ability to carry out an environmental audit</p> <p>19. an awareness of a variety of child development and learning theories and the ability to use these theories in selecting, developing and implementing strategies to achieve environmental education goals;</p> <p>20. the ability to utilise appropriate theories of moral reasoning in selecting, developing and implementing environmental education strategies to achieve environmental education goals.</p>	

### What are SD-competencies?

In order to face the global challenges which endanger humanity and to arrive at sustainable lifestyles, efforts are needed at the personal as well as collective and global levels. What exactly should individuals be capable of in order to progress towards a sustainable life?

Competencies are needed to observe, evaluate, decide and act in a sustainable manner. Different concepts have emerged from the international discussions, describing which competencies should be developed; some are very concrete, some are more general or even abstract. The following table lists ideas from four sources.

While the OECD DeSeCo Study suggests the ‘use of tools’, ‘interacting in heterogeneous groups’ and ‘autonomous acting as the key competencies’, de Haan’s concept of ‘shaping competence’ (‘Gestaltungskompetenz’) lists twelve types of competencies involving interdisciplinarity, cosmopolitan perception, empathy and more.

In contrast, the Core Curriculum Framework is much more concrete, as it focuses on human development, and under the domains ‘Recognition’, ‘Evaluation’ and ‘Action’, eleven core competencies are listed which are recognised as necessary in the context of development issues. Finally, Marco Rieckmann has tried to represent the consensus of different European and Latin American national discussions on the competencies to be developed to be able to contribute to and realise sustainable lifestyles collectively as well as individually.

The ideas of SD competencies can provide a starting point for the teacher to think about what they would like to see their students become capable of.



**Table 2: Concepts of competencies**

<p>OECD (2005) DeSeCo: Definition and selection of key competencies</p>	<p>Shaping competence ('Gestaltungskompetenz') (BLK21/Transfer 21/ de Haan 2006, 2008)</p>	<p>Cross-curricular framework for global development education in the context of Education for Sustainable Development (2007)</p>	<p>Rieckmann study (2011)</p>
<p><b>Using tools interactively</b></p> <p>The ability to use:</p> <ul style="list-style-type: none"> <li>• language, symbols and text interactively;</li> <li>• knowledge and information interactively;</li> <li>• technology interactively.</li> </ul> <p><b>Interacting in heterogeneous groups</b></p> <p>The ability to:</p> <ul style="list-style-type: none"> <li>• relate well to others;</li> <li>• cooperate;</li> <li>• manage and resolve conflicts.</li> </ul> <p><b>Acting autonomously</b></p> <p>The ability to:</p> <ul style="list-style-type: none"> <li>• act within the big picture;</li> <li>• form and conduct life plans and personal projects;</li> <li>• assert rights, interests, limits and needs.</li> </ul>	<p><b>Competency in:</b></p> <ul style="list-style-type: none"> <li>• anticipatory thinking;</li> <li>• interdisciplinary work;</li> <li>• cosmopolitan perception and change of perspectives;</li> <li>• handling incomplete and complex information;</li> <li>• participatory competency;</li> <li>• cooperation;</li> <li>• dealing with conflicts of goals;</li> <li>• self-motivation and motivating others;</li> <li>• distanced reflection on individual and cultural models;</li> <li>• independent action;</li> <li>• ethical action, and capacity for empathy and solidarity.</li> </ul>	<p><b>Recognition</b></p> <ul style="list-style-type: none"> <li>• Gather information on globalisation and development issues and process them thematically;</li> <li>• recognise socio-cultural and natural diversity in a globalised world;</li> <li>• analyse globalisation and development processes applying the guiding principle of sustainable development;</li> <li>• recognise different structural levels from the individual to the global and identify their respective functions for development processes.</li> </ul> <p><b>Evaluation</b></p> <ul style="list-style-type: none"> <li>• contemplate their own and unfamiliar value orientations in their greater meaning for life choices;</li> <li>• form opinions and simultaneously orient this opinion on the international consensus on sustainable development and human rights after critically contemplating globalisation and development issues;</li> <li>• develop tactics to assess development aid measures and</li> </ul>	<ul style="list-style-type: none"> <li>• Competency for systemic thinking and handling of complexity;</li> <li>• competency for anticipatory thinking;</li> <li>• competency for critical thinking</li> <li>• competency for acting fairly and ecologically;</li> <li>• competency for cooperation in (heterogeneous) groups;</li> <li>• competency for participation</li> <li>• competency for empathy and change of perspective;</li> <li>• competency for interdisciplinary work;</li> <li>• competency for communication and use of media;</li> <li>• competency for planning and realising innovative projects;</li> <li>• competency for evaluation;</li> <li>• competency for ambiguity and frustration tolerance.</li> </ul>

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		<p>come to independent evaluations allowing for diverse interests and determining factors.</p> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>• recognise areas of personal co-responsibility for humankind and the environment and take up the challenge;</li> <li>• overcome socio-cultural and special interest obstacles in communication, cooperation and conflict management;</li> <li>• ensure society's ability to act on global change, especially on a personal and professional level, through openness and a willingness to innovate as well as through a reasonable reduction of complexity and be able to tolerate the uncertainty of open-ended situations;</li> <li>• School children are able to and, based on their politically mature decisions, promote the goals of sustainable development in their private, school and professional lives and take an active role in putting them into practice on a social and political level.</li> </ul>	



## What are ESD-competencies?

To progress towards a more sustainable human condition, efforts and changes are needed in all parts of societies, and also in schools. In this context, Education for Sustainable Development is to be understood as the pedagogical answer to the global challenges and as part of the collective efforts towards a (more) sustainable world.

The described SD-competencies (of learners) must not be confused with the ability (of teachers) to create, design and realise lessons in the sense of education for sustainability. This specified ability is to be understood as ESD-competence. ESD-competencies are what a teacher must have to create a learning arrangement in which students are enabled to develop their individual SD-competencies. The ideas developed by the UNECE working group will be chosen to explain the ESD-competence approach (see table 3).

According to this model, teachers have to be ready for 'learning to know', 'learning to do', 'learning to live together' and 'learning to be'. Under these categories of individual development, combined with the concepts of a holistic approach, envisioning change and achieving transformation, the teacher is described in detail as a person with manifold abilities and competencies, which allow him or her to create learning situations in which students develop their SD-competencies. To succeed as a teacher in the field of education for sustainable development, a teacher not only has to be able to create appropriate lessons, but must also be convincing and should develop his or her individual SD-competencies.

## How do I develop competencies?

'Competencies can't be taught, they have to be developed' is one of the central and crucial findings in the discussion about competencies.

One has to recognise the immediate consequences on the arrangement of single lessons in particular as well as on the school in general. Especially the use of self-organising learning methods have to be decided carefully, verifying which method would strengthen the autonomy and self-confidence of the learner most without overburdening him or her. If we want to educate young people to act in an autonomous and responsible manner, then we also have to make them act in this manner in school and not keep them as dependent learners. Therefore, we as teachers or trainers have to create learning arrangements which are appropriate for learners to develop all those competencies needed for sustainable development.

From a methodological point of view, this means that we should arrange our lessons in a way that encourages the learners to act and take responsibility for the space they are in, socially as well as institutionally. For example, it is better to make learners responsible for parts of the water supply of a school, than to explain the necessity to do so in a theoretical approach. This approach calls for a review of the institution of schools. In this sense, schools should rather become a place for experiencing sustainability than a place of restricted learning.

Experiences show that the more able students cope easily with such methods and clearly benefit, while the less able students may understand less and even get worse results compared to more conservative forms of teaching. Therefore, it is necessary to coach and support them carefully.

In the same way, teachers must also develop their own ESD-competencies. Learners may not understand when the teaching approach is changed. Teachers should reflect on their own methods and be prepared to change methods that do not work. Teachers also must be aware that they may have to rectify incorrect things that students learned in their 'unsuccessful' teaching attempts.



**Table 3: Competencies for educators in education for sustainable development (Source: UNECE, 2011)**

	<b>Holistic approach</b> Integrative thinking and practice	<b>Envisioning change</b> Past, present and future	<b>Achieving transformation</b> People, pedagogy and education systems
<p><b>Learning to know</b></p> <p><i>The educator understands....</i></p>	<ul style="list-style-type: none"> <li>the basics of systemic thinking;</li> <li>ways in which natural, social and economic systems function and how they may be inter-related;</li> <li>the interdependent nature of relationships within the present generation and between generations, as well as those between rich and poor and between humans and nature;</li> <li>their personal world view and cultural assumptions and seeks to understand those of others;</li> <li>the connection between sustainable futures and the way we think, live and work;</li> <li>their own thinking and action in relation to sustainable development.</li> </ul>	<ul style="list-style-type: none"> <li>the root causes of unsustainable development;</li> <li>that sustainable development is an evolving concept;</li> <li>the urgent need for change from unsustainable practices towards advancing quality of life, equity, solidarity, and environmental sustainability;</li> <li>the importance of problem-setting, critical reflection, visioning and creative thinking in planning the future and effecting change;</li> <li>the importance of being prepared for the unforeseen and a precautionary approach;</li> <li>the importance of scientific evidence in supporting sustainable development.</li> </ul>	<ul style="list-style-type: none"> <li>why there is a need to transform the education systems that support learning;</li> <li>why there is a need to transform the way we educate/learn;</li> <li>why it is important to prepare learners to meet new challenges;</li> <li>the importance of building on the experience of learners as a basis for transformation;</li> <li>how engagement in real-world issues enhances learning outcomes and helps learners to make a difference in practice.</li> </ul>
<p><b>Learning to do</b></p> <p><i>The educator is able to...</i></p>	<ul style="list-style-type: none"> <li>create opportunities for sharing ideas and experiences from different disciplines/places/cultures/generations without prejudice and preconceptions;</li> <li>work with different perspectives on dilemmas, issues, tensions and conflicts;</li> <li>connect the learner to their local and global spheres of influence.</li> </ul>	<ul style="list-style-type: none"> <li>critically assess processes of change in society and envision sustainable futures;</li> <li>communicate a sense of urgency for change and inspire hope;</li> <li>facilitate the evaluation of potential consequences of different decisions and actions;</li> <li>use the natural, social and built environment, including their own institution, as a context and source of</li> </ul>	<ul style="list-style-type: none"> <li>facilitate participatory and learner-centred education that develops critical thinking and active citizenship;</li> <li>assess learning outcomes in terms of changes and achievements in relation to sustainable development.</li> </ul>

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		learning.	
<b>Learning to live together</b>  <i>The educator works with others in ways that....</i>	<ul style="list-style-type: none"> <li>actively engage different groups across generations, cultures, places and disciplines.</li> </ul>	<ul style="list-style-type: none"> <li>facilitate the emergence of new worldviews that address sustainable development;</li> <li>encourage negotiation of alternative futures.</li> </ul>	<ul style="list-style-type: none"> <li>challenge unsustainable practices across educational systems, including at the institutional level;</li> <li>help learners clarify their own and others world views through dialogue, and recognise that alternative frameworks exist.</li> </ul>
<b>Learning to be</b>  <i>The educator is someone who....</i>	<ul style="list-style-type: none"> <li>is inclusive of different disciplines, cultures and perspectives, including indigenous knowledge and world views.</li> </ul>	<ul style="list-style-type: none"> <li>is motivated to make a positive contribution to other people and their social and natural environment, locally and globally;</li> <li>is willing to take considered action even in situations of uncertainty.</li> </ul>	<ul style="list-style-type: none"> <li>is willing to challenge assumptions underlying unsustainable practice;</li> <li>is a facilitator and participant in the learning process;</li> <li>is a critically reflective practitioner;</li> <li>inspires creativity and innovation;</li> <li>engages with learners in ways that build positive relationships.</li> </ul>