



PATHWAYS TO THE FUTURE

EDUCATION FOR SUSTAINABLE DEVELOPMENT

22.04.2015–24.04.2015
TALLINN, ESTONIA



REPUBLIC OF ESTONIA
ENVIRONMENTAL BOARD



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Investing in your future

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International conference on education for sustainable development Pathways to the Future 22.-24. April 2015 in Tallinn

Pathways to the Future is an international conference dedicated to the rapidly evolving field of education for sustainable development (ESD). The four major themes of the conference are creativity, values, sustainable schools and communities, i.e. the aspects that form the basis for education for sustainable development. In a friendly and inspiring atmosphere the event will provide an opportunity to share ideas and experiences and to discuss the future of education which could support sustainable development. The conference attempts to pinpoint the difficulties and focal points of applying ESD as well as highlight the success stories. Researchers and practitioners across the world share their experience.

About the programme “Development of environmental education”

The aim of the programme “Development of environmental education” co-financed by the European Social Fund (ESF) is to give momentum to the development of environmental education in general as well as non-formal education. The programme was launched in 2011 with the ending planned to August 2015. The programme is executed by the Environmental Board and its financial volume is 3.2 million Euros, of which 85% is granted by the ESF. The most significant of the programme’s activities is the organisation of in-service training for teachers of the formal educational system, teaching staff of higher education and specialists offering non-formal environmental education. A cooperation network for environmental education is developed within the framework of the programme to ensure that the education based on the national curricula and extra-curricular environmental education support each other. The aim is to increase the awareness of the principles of sustainable development within the Estonian population and to ensure a systematic and lasting development of environmental education. The activities of the programme have included three surveys on training needs

of teachers, the availability of teaching aids and networking. More than half a thousand teachers and specialists of informal environmental education have received training on the use of active learning methods in teaching sustainable development. As of 2010, county round tables for environmental education and information events introducing the opportunities of environmental education in counties are organised. 24 regional conferences on environmental education have been organised between 2011 and 2014. Three seasons of television and radio shows on the topics of sustainable development have been aired to inform the population and increase its awareness: Mõistlik või Mõttetu ("Reasonable or unreasonable") on Estonian National Television and Ökoskoop ("Eco-scope") on Vikerraadio. The website of environmental education has been updated with teaching resources as well as information on environmental education centres with the services they offer made available. Related reading material in Estonian and Russian is offered by the information brochure Keskkonnaharidusleht. Eight innovative teaching tools have been developed, of which the material tools (5) will be distributed to the environmental education centres and 3 internet-based tools will be publicly available. 50 film clips on sustainable development are under preparation and made publicly available on the web. The organisation of an international conference in the closing year of the programme is a wonderful and hopefully very inspirational stage in the development of education regarding the environment and sustainable development in Estonia.

DAY 1
22 April 2015

Tallinn University, Astra building (Narva rd 29) Foyer, 1st floor

15.00-17.00 • Registration and coffee • 1 floor foyer

Tallinn University, Astra building (Narva rd 29) Auditorium Maximus (ground floor)

17.00-17.30 • Conference opening; welcome address

17.30-18.30 • Keynote 1: Insights into Estonian SD and ESD in Estonia • Kaja Peterson & Rea Raus, Estonia

18.30-19.30 • Keynote 2: An Integral Approach to Learning the Leadership Skills Needed for Sustainability Transitions • John Fien, Australia

Tallinn University, Astra building (Narva rd 29) Foyer, 1st floor

20.00-22.00 • Welcome reception

23 April 2015

DAY 2
23 April 2015

Tallinn University, Astra building (Narva rd 29) Foyer, 1st floor

8.00 • Registration

Tallinn University, Astra building (Narva rd 29) Auditorium Maximus, ground floor

9.00-10.00 • Keynote 3: Teaching and learning against the grain while going with the flow: educational innovations for the great transition • Arjen Wals, The Netherlands

10.00-10.30 • Coffee break

10.30-12.10 • Parallel sessions

Astra building, room A046, ground floor

Session 1
Creativity in and for ESD. Chair: Liisa Puusepp

10.30-10.50 • Dare to dream?: Role of inspiration and participation in moving towards a more hopeful future in landscape governance • Joanna T. Storie, Latvia

10.50-11.10 • Shadow play and animation as methods for ESD with 5-9th graders • Hanniina Manner, Finland

11.10-11.30 • Creative Drama in the Teaching of Education for Sustainable Development: Sustainability and Sustainable Production Activity • Özgül Keleş, Turkey

11.30-11.50 • Teaching education for sustainability - experiences from the University of Tartu
Marianne Lind, Estonia

11.50-12.10 • Discussion

12.10-13.30 • Lunch

10.30-12.10 • Parallel sessions

Silva building, room S116, 1st floor

Session 2

Values and Ethics. Chair: Triin Käpp

10.30-10.50 • What's love got to do with it? Probably everything • Dr Robbie Nicol, Scotland

10.50-11.10 • Environmental responsibility as an issue in social school subjects • Essi Aarnio-Linnanvuori, Finland

11.10-11.30 • The 2-MEV model: 15 years of monitoring green attitudes and values • Franz X. Bogner, Germany

11.30-11.50 • To use the experience of traditional culture for teaching sustainable development • Taive Särg, Estonia

11.50-12.10 • Discussion

12.10-13.30 • Lunch

10.30-12.10 • Parallel sessions

Silva building, room 232, 2nd floor

Session 3

Sustainable Communities. Chair: Erkki Peetsalu

10.30-10.50 • Sustainability education in an ecocommunity school: experience of an Estonian ecocommunity
Riinu Lepa, *Estonia*

10.50-11.10 • Global Education and Education for Sustainable Development Interwined - Experiences and Best Practices from Estonian NGO Mondo • Johanna Helin, Estonia

11.10-11.30 • Teaching Social Entrepreneurship: Example of Armenian Mountain Communities • Baiba Svane, Latvia

11.30-11.50 • Solvik School. It's not about talking, but doing • Evelin Tamm, Estonia

11.50-12.10 • Discussion

12.10-13.30 • Lunch

10.30-12.10 • Parallel sessions

Astra building, Auditorium Maximus, ground floor

Session 4

Sustainable Schools. Chair: Rea Raus

10.30-10.50 • ESD in World Heritage Education (WHE) - a study of teachers conceptions and experiences of WHE in Kvarken Archipelago • Ida Berg, Finland

10.50-11.10 • Project „Hello, Spring!“ – Over 20 years of Values Education through Nature and Environmental Education • Terje Tuisk, Estonia

11.10-11.30 • Investigating the effect of ESD-implementation in the Swedish school system by assessing students' sustainability consciousness • Niklas Gericke, Sweden

11.30-11.50 • An education for sustainability dissemination program in Israeli schools: Changes in the schools and in student outcomes • Tali Tal, Israel and USA

11.50-12.10 • Sustainable schools – missing points • Anna Batorczak, Poland

12.10-13.30 • Lunch

10.30-12.10 • Parallel sessions

Silva building, room S412, 4th floor

Session 5**Sustainable Schools - Methods. Chair: Ilga Zalite****10.30-10.50 • Education as Lived Experience-Food for Mind and Soul • Sue Clutterbuck, *United Kingdom*****10.50-11.10 • Think before you Buy – Choose products with less hazardous substances. A teacher's handbook**
Kai Klein, *Estonia***11.10-11.30 • Global Education workshops for non-formal learning in the Youth Sector • Uku Visnapuu, *Estonia*****11.30-11.50 • Practical tools for understanding nature • Marika Kose, *Estonia*****11.50-12.10 • Practical education with "Home from Earth" • Sven Aluste, *Estonia*****12.10-13.30 • Lunch****13.30-15.00 • Parallel sessions**

Astra building, room A046, ground floor

Session 6**Creativity in and for ESD. Chair: Uku Visnapuu****13.30-13.50 • Teach the Future • Erica Bol, *The Netherlands*****13.50-14.10 • Creative cross-curricular performance-project for climate change education • Anna Lehtonen, *Finland*****14.10-14.30 • Integrating environmental subjects into language studies • Anne Kivinukk, *Estonia*****14.30-14.50 • How do we go fostering creativity and sustainability in Secondary Science curriculums? Case study in Ghana, Nabdram district • Karolin Mäe, *Estonia*****14.50-15.00 • Discussion****15.00-15.30 • Coffee break****13.30-15.00 • Parallel sessions**

Silva building, room S116, 1st floor

Session 7**Values and Ethics. Chair: Triin Käpp****13.30-13.50 • Highlighting the value prototyper of modern young people in the context of sustainable education and development • Ilze Strobe, *Latvia*****13.50-14.10 • Finding roots in all globalising world. Value education of national identity • Merike Mitt, *Estonia*****14.10-14.30 • Why should they care? • Imbi Kõiv, *Estonia*****14.30-14.50 • Explaining the prevalence of environmental values in European countries • Kati Orru, *Estonia*****14.50-15.00 • Discussion****15.00-15.30 • Coffee break**

13.30-15.00 • Parallel sessions

Silva building, room 232, 2nd floor

Session 8**Sustainable Communities. Chair: Erkki Peetsalu****13.30–13.50 • The Role of Urban Green Areas in the Education for Sustainable Development - Focus on Krakow**Aleksandra Wagner, *Poland***13.50–14.10 • Small Businesses in Creative Quarters as Educators for Sustainable Development: Case of Riga**Dzineta Dimante, *Latvia***14.10–14.30 • Educational inequality as an example of unsustainable use of human resources**Mai Beilmann, *Estonia***14.30–14.50 • On board - an action programme to advance environmental awareness and responsibility in the Uusimaa region of Finland for 2014–2017 • Maria Runonen, Finland****14.50–15.00 • Discussion****15.00-15.30 • Coffee break****13.30-15.00 • Parallel sessions**

Astra building, Auditorium Maximus, ground floor

Session 9**Sustainable Schools. Chair: Rea Raus****13.30–13.50 • Introducing ESD in higher education in the Baltic Sea Region - challenges and drivers**Paula Lindroos, *Finland***13.50–14.10 • Story of my 12 years experience on teaching ESD • Gaye Teksoz, Turkey****14.10–14.30 • Sustainability of interpersonal relationships in educational context: possibilities in teachers' training • Kadri Ugur, Estonia****14.30–14.50 • What does it take to reroute a tanker? Lessons learned in 25 years of innovative teaching in environmental and sustainability sciences at the University of Lüneburg (Germany)**Maik Adomßent, *Germany***14.50–15.00 • Discussion****15.00-15.30 • Coffee break**Tallinn University, Astra building (Narva rd 29)
Auditorium Maximus (ground floor)**15.30-16.30 • Keynote 4: The use of PRISE as a way to support schools in their development towards (E)S**Gerben de Vries & André de Hamer, *The Netherlands***16.30-17.30 • Keynote 5: The unappealing smells of sacrifice - values, sustainability and education**Leon Robinson, *United Kingdom***17.30-18.30 • Spare time****18.30 • Bus transfer to the Seaplane Harbour from Tallinn University**

(bus is waiting at the entrance of Mare house, behind the Tallinn University campus)

19.00-23.00 • Conference Dinner at Seaplane Harbour, Estonian Maritime Museum • Vesilennuki 6, Tallinn**19.00-20.00 • Exhibition visit at the Estonian Maritime Museum****20.00-23.00 • Gala dinner****23.00 • Bus transfer from the Seaplane Harbour back to the Conference hotels**

(Viru Hotel, Park Inn by Radisson Central Tallinn, Center Hotel)

DAY 3
24 April 2015

Tallinn University, Astra building (Narva rd 29), Auditorium Maximus (ground floor)

9.00-10.00 • Keynote 6: **Bringing ESD Home** • Natalia Eernstman, *United Kingdom*

10.00-11.00 • Keynote 7: **Student engagement for sustainability: Experiences from higher education**

Daniella Tilbury, *United Kingdom*

11.00-11.30 • **Coffee break**

11.30-12.30 • **Parallel sessions**

Astra building, room A046, ground floor

Session 10

Sustainable Schools. Chair: Kai Klein

11.30-11.50 • **Philosophising with 3 to 12 years old children in Estonia** • Egle Säre, *Estonia*

11.50-12.10 • **Understanding sustainability: between renewable resource and linguistic puzzle**

Jerzy Sleszynski, *Poland*

12.10-12.30 • **Gaia School** • Marit Otsing, *Estonia*

12.30-13.15 • **Lunch**

11.30-12.30 • **Parallel sessions**

Astra building, Auditorium Maximus, ground floor

Session 11

Sustainable Schools. Chair: Rea Raus

11.30-11.50 • **Teaching-learning divide in education for sustainable development and a way out** • Maie Kiisel, *Estonia*

11.50-12.10 • **LYKE-network helping Finnish schools with their ESD** • Niina Mykrä and Jenni Skaffari, *Finland*

12.10-12.30 • **The Mission** • Wolfgang Brunner, *Sweden*

12.30-13.15 • **Lunch**

11.30-12.30 • **Parallel sessions**

Astra building, room A303, 3rd floor

Session 12

Sustainable Schools. Chair: Tiina Elvisto

11.30-11.50 • **From sustainable design to sustainable implementation: knowledge supply chains for a green economy** • Tove Holm, *Finland*

11.50-12.10 • **Finnish and Swedish ninth graders' perceptions of climate change** • Linda Degerman, *Finland*

12.10-12.30 • **Integrating sustainable practices for daily life into curriculum - Wroclaw Univeristy of Environmental and Life Sciences case study** • Katarzyna Sabura, *Poland*

12.30-13.15 • **Lunch**

13.15-14.15 • **Poster session with coffee**

14.15-15.00 • Keynote 8: **Ecologies of knowledge: Can semiosis be sustainable?** • Timo Maran, *Estonia*

15.00-16.00 • Panel discussion • Chair: Kadri Kalle,
Panelists: Leon Robinson, Arjen Wals, Riinu Lepa, Kadi Kenk, Janika Ruusmaa

16.00-16.30 • **Closing session**

Insights into Estonian SD and ESD in Estonia

Kaja Peterson & Rea Raus, Estonia

The early 1990-ies was not only the years of gaining re-independence for Estonia, but it was the era of re-establishing international relationships. Estonia was the second country after Costa Rica in the world to adopt Sustainable Development Act in 1995. The spirit of the Rio conference was not only transferred into the Act but also a governmental commission on SD was established already in 1996. But then other than SD objectives took over and the SD Act and the SC Commission – land and property restitution, institutional and tax reforms, and other restructuring of the society to mainstream economic growth and civil rights. The presentation shall guide the listeners through the 25 years of mainstreaming sustainable development in Estonia and demonstrate the dilemmas and tradeoffs of economic growth and human wellbeing being made at different scales (visionary, sectoral, local governmental and consumer-level) of decision making.

Environmental education (EE) has a long history in Estonia, we have records e.g. from 1919 where topics related to environment were taught in schools. During Soviet times environmental education was practiced also in several nature clubs and during extra-curricular activities in schools, also Nature Centers in some bigger cities. After regaining independence, in 1996 Estonia included the cross-curricular topic “Environment” into National School Curriculum. “Environment and sustainable development” as a cross-curricular topic was introduced in 2002. State organisations like State Forest Management Center, Department of Environment Education, Environmental Board, Museum of Natural History etc. are responsible for co-ordinating, developing and implementing the activities related EE and ESD. Currently, there are many organisations and initiatives, in addition to formal schooling, where ESD and EE are implemented, e.g. 18 nature centres that belong to State Forest Management Center, about nearly 50 NGOs. From 2010, EU funding has remarkably supported the development of the whole field e.g. ERDF funding for “Development of environment education infrastructure” in the amount of 22,3 MEUR. During 2013-2015 an extensive in-service training programme for teachers, university lecturers and non-formal environment

education specialists was launched that focused on teaching and learning sustainability. During the programme, in addition to learning about ESD, participants have initiated deep discussions about the future of ESD as well as created hundreds of related learning programmes and school projects.

We know and sense that the key for a much and promptly needed transformation for sustainability lies in the field of education, in our value-systems, in our worldviews and mind-sets. The questions for all of us still remain-we, educationalists, teachers, researchers, individuals- are we ready to transform ourselves? What are the root causes for our unsustainability challenge and how to really learn, teach and practice sustainability?

An Integral Approach to Learning the Leadership Skills Needed for Sustainability Transitions

John Fien, Australia

After an international decade focus on Education for Sustainable Development, what do we know of the knowledge, skills and attitudes needed to hasten the sustainability transitions we need for a fairer, less troubled and more sustainable world? Reports presented at the 2014 end-of-Decade conference in Nagoya, Japan point to many innovations in ESD policies and programs, many strategic learnings, and new plans for building on these successes.

However, is there a possibility that locking the Decade of ESD into the UNESCO agenda for quality education – and trusting that improved educational systems, formal and non-formal, that result will lead to the world's population acquiring the knowledge, skills and attitudes needed to work towards sustainability – may have diluted our focus on the urgency of the global challenges that are causing us to transgress planetary boundaries that support human and non-human life on Earth.

This more instrumental view of education (and ESD) was also a part of thinking during the UN Decade in which the altruistic value of a quality education was complemented by the instrumental focus on, for example, climate change education, skills for employability in a carbon-constrained economy, and education for disaster risk reduction.

This presentation will argue that this complementarity is necessary and that an educational focus on the big global challenges of poverty alleviation can achieve both the altruistic and instrumental goals of ESD. Learning the leadership skills needed to address the challenges of climate change, economic disruption, and so on – which are all “wicked problems” – within the frameworks of integral thinking and education is recommended as one way of doing this.

Teaching and learning against the grain while going with the flow: educational innovations for the great transition

Arjen Wals, The Netherlands

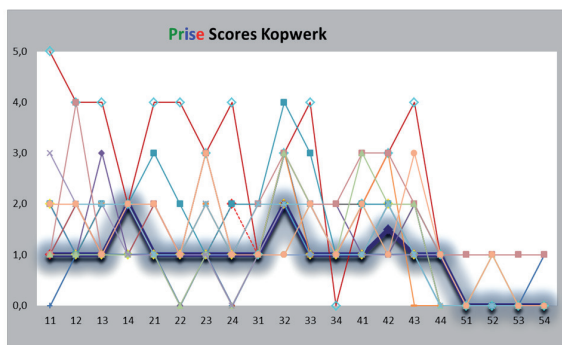
The rising popularity of 'sustainability' in science, society and the world of business could easily turn it into a 'neutered' political concept and a 'catch-all' concept stripped from its original intent to address global systemic dysfunction. To avoid this ESD needs to be critical and reclaim a focus on the well-being of people and planet with the economy serving people and planet, rather than the other way around. The creation of a more sustainable world above all, requires learning, and not just any learning, but learning that leads to a new kind of thinking, alternative values and co-created, creative solutions, co-owned by more empowered citizens, living in a more reflexive, responsive and responsible society.

In 'teaching and learning against the grain while going with the flow' I explore learning-based innovations that can help people re-connect with each other and the planet by critically examining their local realities and the globalizing forces that affect these realities, while working on meaningful and ethical socio-ecological outcomes. Examples of such learning include: ICT-supported citizen/civic science, arts-based sustainability education, hybrid learning in vital coalitions and whole school approaches.

The use of PRISE as a way to support schools in their development towards (E)SD

Gerben de Vries & André de Hamer, The Netherlands

In September 2014 The Learning Teacher Network advised Unesco how to move on in the field of educational reform heading towards ESD. One of the advices was: 'schools should build ESD on evidence at assessment and evaluation'. In The Netherlands an organization called 'Duurzame Pabo' (www.duurzamepabo.nl) in 2011 developed an assessment- and evaluation instrument for ESD in primary education, called PRISE (primary sustainable education). The instrument is based on the original version of AISHE, auditing instrument for sustainability in higher education (DHO 2001) and the EFQM (European federation for quality management) model for quality check in education. The PRISE instrument is a system based, holistic instrument. It covers policy, environmental care, human resource management, curriculum, assessments, external contacts and more in context and coherence. After six pilots in the city of Utrecht, PRISE was used to analyse twenty-three primary schools in the northwestern part of The Netherlands. The results of this analysis were quite similar to those of the pilots. All together these results gave some insight in what's going on and what's going wrong when it comes to ESD in Dutch primary schools.



The diagram shows higher scoring schools (f.i. the red line with the open blue squares), low scoring schools and a median (the fat blue line) that gives an impression about the general situation in The Netherlands: in most schools 'something, but not structural' happens; the higher scores of the median are criteria where external factors (governmental policy, a textbook) are decisive; scores 34, 51-54 are about tests and evaluation, which are rarely done. The most likely explanation for this is the lack of governmental steering: schools don't have to do anything. High scores are results of individual policy of schools and/or teachers in these schools.

The results of the analyses were used for school improvement in the twenty-three schools. Advises for innovation, mostly based on Lozano (2006), Chenoweth/Everhart (2001) and De Vries (2010), were given and –if possible- worked out:

- The schools nowadays work together with stakeholders like Ecomare (<http://www.ecomare.nl>), institute for protection of sea life, local and national authorities.
- A curriculum and a website on ESD were developed for all schools. Every year there is a meeting day for all teachers. The day is used for evaluation of ESD, looking forward and inspiration.
- Communication with the local community improved, using internet, excursions etc.
- PRISE criteria were used for further development.
- A general ESD coordinator was appointed for all schools. She acts as coach, trainer, contact person, source of inspiration for the schools.
- Schools split up in communities of practice. Some started working with Guus Geisen on Autopoiesis, a holistic approach towards ESD. Others started working on a solar panel project, using solar panels for energy, checking the electricity supply and cost reduction for all kinds of lessons.

Over all, the PRISE instrument did meet the demands of the schools. Looking at the advises from the Learning Teacher Network to Unesco, PRISE might be a good starting point for discussions on assessment and evaluation strategies for primary schools all over the world.

Literature mentioned above:

Chenoweth, T.G. & Everhart, R.B, Navigating comprehensive school change, Larchmont USA 2002.

Geisen, G, Autopoiesis, Agentschap Utrecht NL 2013.

Learning Teacher Network, Recommendations for the implementation of the GAP on ESD, September 2014.

Lozano, R., Incorporation and institutionalization of SD; Journey of Cleaner Production 14 (2006) 787-796.

Roorda, N. (e.a.), Aishe auditing instrument for sustainability in higher education, DHO Amsterdam 2001/2010.

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The unappealing smells of sacrifice - values, sustainability and education

Leon Robinson, United Kingdom

How do we reconcile the demands of a growing human population, eager to enjoy the fruits of consumer capitalism, with the growing threat of environmental catastrophe? How long will we be able to maintain a coherent sense of the sanctity of human life, as the population of developed countries grows older and hungrier for scarcer resources? How can we ever convince young people that the shiny new thing that they are currently craving will not make them happier, or the world better?

Educating school pupils about the values of sustainability is usually attempted against a background noise of competing and conflicting consumer values, the din of which issues from organisations and entities with far greater material resources and powers of seduction than can ever be mustered by schools. Ideas of economic well-being are often measured in the unsustainable model of "growth", while the practice of built-in obsolescence has been accelerating as never before. The concept of "enough" is seldom used in advertising, as it is anathema to the values of consumerism, but is at the heart of both Aristotelian Virtue Ethics, subsequent articulations of virtue, and Buddhist teachings.

This paper will explore the tensions, challenges and opportunities in contemporary education for sustainability, drawing on philosophical and theological perspectives from both Eastern and Western traditions, contrasting the contemporary notion of "sacrifice" as giving up, and going without, with the original ideas of sacrifice as the ritual celebration of gratitude for abundance. The ritual perspective allows a re-sanctifying of life, without necessarily requiring theistic beliefs.

The paper also draws on contemporary research into human happiness as a fundamental part of well-being, contrasting the imagery of consumerist values with the realities of a culture increasingly driven to medicating its own misery. The paper is a positive and hopeful response to a complex set of crises facing contemporary cultures.

Key words: values, sustainability, education, sacrifice, abundance

Bringing ESD Home

Natalia Ernstman, United Kingdom

In this presentation I will argue that a major driver of the sustained unsustainability of our society is the excessive 'objectification' of education, environmental issues and even ESD. 'Sustainability experts' such as engineers, academics and politicians, take it upon themselves to define and design sustainable development, but do so in analytical, distancing and instrumental fashions. As a consequence 'sustainability' becomes an abstract concept separated from our daily lives. Citizens, communities and learners are robbed of their 'response ability' to act in the face of the environmental crisis. Overwhelmed by the magnitude and complexity of the problems, and uninspired by the expert-conceived distancing conceptions, people lose both the sense that it is up to them to act, as well as the feeling that they actually have the ability to do something.

Although we, ESD academics and practitioners, like to think that through our actions we catalyse change, transform learners, innovate education and re-invent teaching methods, a lot of what we do echoes the objectifying educational paradigm that separates learning from the lived world that it ought to apply to.

Sustainability is still often taught as a subject on its own, instead of integrated with everything else that sustains our lives; we still mainly learn about sustainable development as if care and agency are things that can be recited from textbooks; and we continue to attribute more value to formal, expert, 'objective' knowledge than informal, vernacular and personal knowledges.

This presentation will interactively explore how we might practice, research and talk about ESD in ways that 'bring sustainability issues home'; making them personal, lived and woven into the grain of our lives, rather than abstracted, remote and separated from daily living. While I give some examples from my educational, artistic and performative practice, you will be invited to disrupt, challenge and disobey, generating a set of new teaching practices for ESD.

Student engagement for sustainability: Experiences from higher education*

Daniella Tilbury, United Kingdom

Student engagement in higher education is becoming the focus of academic conversations, policy documents and recent studies. This backdrop provides an important context to understanding current changes in Universities, colleges and schools around the world. The student engagement narrative resonates deeply with proponents of sustainable development who seek change in the teacher-learner relationship and transformative outcomes through education. However, the contextual dynamics of institutions and narrow interpretations of the principle of 'student engagement' in sustainable development have led to a fixation on studies to establish student satisfaction levels and the testing of behaviour change strategies rather than on research to improve participation or empowerment levels. This interactive presentation sees this as a key obstacle to developing genuine student engagement and invites the audience to define experiences that can truly support student engagement and leadership for sustainability.

** This presentation is based on a chapter written for the Routledge Handbook of Higher Education for Sustainable Development which is to be published late 2015.*

Ecologies of knowledge: Can semiosis be sustainable?

Timo Maran, Estonia

In this presentation, I observe sustainability, education and knowledge from the semiotic perspective. An essential principle of sustainable development is to keep human technological development, use of resources, social and knowledge processes within the carrying capacity of the biosphere. The human semiosis appears to grow, however, without any borders (Kull 1988). Semiosis is used here as an umbrella term to denote any kind of sign process: perception, cognition, communication, naming etc. This paradox is the central topic of my presentation: how can ever-growing knowledge support sustainable development?

We have shown elsewhere that human ability to use symbolic sign systems for accumulating and conveying knowledge are deeply related with environmental degradation (Maran, Kull 2014; Maran 2014). Humans act upon environment based on their knowledge and imprint their semiotic character onto other living organisms and matter. This can have deterring effects for sign action of other organisms (Maran 2014). Kalevi Kull has proposed that in order to be sustainable, knowledge should be incomplete and the culture should be willing to forget (Kull 1988).

In this presentation, I take a look at an alternative possibility. Namely, in regard to some biological phenomena (mimicry, biophony) it has been noticed that knowledge is not limited to one species, but rather spread and maintained by many species in biological community (Kull 2010; Malavasi et al. 2014; Maran 2012). Such biologically shared knowledge can be called “ecological codes” (Maran 2012). I propose that human knowledge can be sustainable if human knowledge and activities remain connected to “ecological codes” and are a part of these broader ecologies of knowledge. In other words, human knowledge is sustainable, if human action makes sense to the other inhabitants of the biosphere.

One of the basic conceptual sources of semiotics is the triadic sign typology of Charles S. Peirce (1931–1958) that distinguishes icons (signs based on feeling / resemblance), indexes (based on relation) and symbols (based on convention). In semiotics, it is generally assumed that human symbolic and language-based knowledge is not accessible to other

species, but resemblance-based icons and relation-based indexes could be (cf. Kull 2009). Therefore, if we aim at the sustainability of semiosis, we should consider how iconic, indexical and symbolic aspects of human knowledge relate to one another. Probably, most obstructive to sustainable development are highly abstract knowledge systems that tend to forget their history and connection to the original context. For environmental education this would mean that teaching biological and ecological knowledge should take into consideration their applicability in the environment. Knowledge that supports sustainable development needs to be “down-to-the-earth” interactional and contextual.

References

Kull, Kalevi 1998. Semiotic ecology: Different natures in the semiosphere. *Sign Systems Studies* 26: 344–371.

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Dare to dream?: Role of inspiration and participation in moving towards a more hopeful future in landscape governance

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A founding member of Ūdenszīmes, a Latvian NGO, is an example of an artist with a vision inspiring a small rural population, helping them to believe, the impossible, could happen. The NGO firstly sought the demolition of a dis-used dairy in the centre, with it its symbol of dereliction in the minds of the people and then initiated various community and art projects. This has raised trust, encouraged collaboration and raised expectations. Today, after a period of seven years of action, this organisation stands at the threshold of daring to think of sustainable ways of raising finances through collaborative business initiatives. Destructive environmental behaviours and poor social cohesion are often an outworking of low self-esteem and past traumas. Particularly true for Central and Eastern Europe, which have faced severe socio-economic transitions. A lack of experience with constructive participation in decision-making and a reluctance to collaborate among communities are often barriers in achieving common environmental targets. Adopting sustainable landscape governance needs inspiration and participation more than mere information. It has to address minds by providing a toolkit to help frame problems and possible solutions, but it also has to address hearts as well. There is a need for innovative approaches to draw artists and story-tellers, scientists and therapeutic professions, conservationists and policymakers, the public and experts into a conversation to help formulate images of a healthy, sustainable lifestyle, well connected to the landscape and the environment in which people live. This is not about portraying a utopia, but inspiring people and bringing hope. Without a dream of the future, without hope, it is unlikely people will be willing to make the tough changes needed to get there.

Shadow play and animation as methods for ESD with 5-9th graders

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Shadow play is an ancient method for storytelling. It is easy to do with materials you can find in most households or school. Animation as a method has also become more available, due to fast development of hardware and software. Environmental School Polku has successfully used both methods in education for ESD. New generations are skilled users of new device and programs. Technology including methods can inspire also those pupils to participate, who would otherwise find it hard to concentrate in education. When working in groups, each pupil can find roles best suited to them (script writing, animation, drawing, sounds, lights etc.). At certain age children find it especially difficult to express their true opinions and ideas. With these groups artistic methods can be very effective since there are no right or wrong answers, only different creative solutions and viewpoints. Workshops give participants tools to visualise their thoughts and present them to others. Duration of our workshops varies between 1 and 4 hours. With more time, the participants will make their own scripts and characters on given topics, with less time you make small modifications to existing scripts. Animations are recorded and given to the participants. The films can then be shared e.g. at school's Internet site via YouTube or similar, or shown at school events. Although the time available for each workshop has been very limited, the method has been a great success. Materials needed for the workshops fit in a rucksack and can be carried to the school using public transportation. For animation we use StopMotion on iPad, for shadow play we use self-made props, mostly of recycled materials.

Creative Drama in the Teaching of Education for Sustainable Development: Sustainability and Sustainable Production Activity

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Creative drama can be adapted to the education for sustainable development and it can be used as an effective instructional strategy. Creative drama, engage the whole person, moves participants between perception of states of being and information to create meaningful understanding. For students to achieve the objectives set by the education for sustainable development program, student-centered teaching methods and techniques should be employed. One of these techniques is creative drama. Drama is part of the teaching and learning. The use of creative drama can be an effective teaching method for students to acquire new information and raise their awareness of the education for sustainable development. Learning sustainable development is currently being highlighted at all levels of education. The awareness of sustainability for maintaining and improving the quality of life in the present and future generation plays vital role. For students who will be our future to be individuals who can find solutions to the sustainable development and discuss the possible outcomes of sustainable living, teachers need sample materials to be used to help their students to achieve the target sustainable living gains. Though the number and severity of the local, national and global problems are rapidly increasing, the number of materials to be used to help students to achieve sustainable living gains in the class is limited. Thus, the present study aims to develop sample creative drama activity that can be used by teachers while teaching sustainability issues. The creative drama activity developed within the framework of the present study are believed to be sample for the practitioners who want to teach basic concepts related to sustainable living and sustainable production.

Keywords: Creative drama, education for sustainable development, sustainability, sustainable production.

Teaching education for sustainability - experiences from the University of Tartu

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The aim of environmental education and education for sustainable development (ESD) is to equip future citizens with the necessary awareness, knowledge, attitudes and skills for a more sustainable future and an proactive approach to apply these in their everyday life. Teachers play a key role in shaping this new generation of citizens and therefore it is important to give the future and present teachers the necessary attitude and a ESD toolkit to make their work easier and meaningful. This presentation is about the experience of one lecturer of ESD at University of Tartu, Estonia. By combining different teaching methods, I think I have been successful in raising awareness about environmental and social problems, passing on the students the knowledge about the complexity and inter-connectedness of global and local issues concerning the environment, economy, social and cultural aspects, changing their preconceptions and attitudes and also shown them that a proactive approach is needed in order for meaningful changes. Throughout the semester, the students improved their skills essential for sustainable development, for example critical thinking and reflection, participating in decision-making, systems thinking and teamwork. I have been combining the materials and methods of global education, traditional teaching and ESD. According to the students' feedback, they felt like they learning the most through active participation, by reading about real life situations, by trying different active learning methods, by watching documentaries and by listening to the presentations of others. In my presentation, I plan to describe some of the methods used and discuss the feedback of the students. In conclusion, teachers of ESD should be creative and innovative in combining different teaching methods and materials and not underestimate their own role as role-models for the students.

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What's love got to do with it? Probably everything.

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When outdoor educators and their students travel through nature the experiences they have are likely to be very different to those in the classroom. Through direct experiences in nature we might exercise and develop the virtue of attention whereby the moral significance of our relationships with nature are based on the attention we pay to them. But how do we get people to pay attention in the first place? I will present self-reported data from students who attended a masters course that I teach. The data are derived from written and oral testimony where students reported deep thinking and/or deep feeling relating to one particular nature-based activity they were asked to do. By locating their experiences within theories of epistemological diversity this presentation explores how a value orientation can be developed that can influence moral action.

Environmental responsibility as an issue in social school subjects

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The environmental crisis is a crisis of society. Even though environmental change can be explained by natural science, its causes and solutions are created by people. Solving global environmental problems requires a major change of values. This relates to environmental education: learning natural science is not sufficient to develop environmental responsibility. Environmental education (EE) has an interdisciplinary emphasis on both nature study and environmental citizenship. This study explores, to what extent environmental themes are intertwined to school subjects that discuss social and ethical issues. Which challenges does a teacher face when including environmental issues into social school subjects? These questions are discussed based on data consisting of Finnish textbooks and teacher interviews. School subjects discussed are history, civics, Lutheran religion and secular ethics. There seems to be confusion about the role of social school subjects in EE: what actually is the specific environmental content of the social school subject in question? Integrating value-laden, cross-curricular issues in teaching contains an element of risk for teachers and textbook authors as they have to discuss issues outside their own field of specification. However, social school subjects offer great possibilities for emphasizing ethics, action and citizenship with EE.

The 2-MEV model: 15 years of monitoring green attitudes and values

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The 2-MEV model is a widely used tool to monitor adolescents' environmental perception by scoring individual attitudes and values. After its first publication (Bogner & Wiseman 1999), the scale's validity has been repeatedly and independently confirmed (Milfont & Duckitt 2004, Johnson & Manolis 2008, Boeve-de Pauw & Petegem 2011). The scale nowadays is in usage within more than two dozen language units all over the world encapsulating ecological/environmental attitude-sets within in two orthogonal higher-order factors: Utilization (U) and Preservation (P). This dichotomous two-factor construction described ecological values as determined by one's position on two orthogonal dimensions: a biocentric one (reflecting conservation and protection of the environment: Preservation) and an anthropocentric one (reflecting the utilization/exploitation of natural resources: Utilization). Within this model, the orthogonality permits an individual position on one dimension independently of that on the other. Consequently, assigning a high individual importance on both the protection of the environment as well as the need to make use of natural resources is possible. This vertical structure of attitudes allows a distinction between those two higher order factors. Thus, the two-dimensional construct organized within a hierarchical fashion made the 2-MEV model increasingly popular. Cross-validation studies with personality variables strongly support the two opposing profiles: High scorers on Preservation were shown to portray controlled and cautious gamblers, Utilizers tended to avoid unpredictable risks, reacted with anger when risks fail, and failed to control risk-taking behavior. Similarly, a European initiative focusing on "green" education issues in monitoring 16 European and Northern African countries showed that the 2-MEV structure existing even in diverse adult (teacher) populations with 12 different languages involved and even with populations outside of Europe such as the Northern African countries.

To use the experience of traditional culture for teaching sustainable development

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Traditional society and its culture have been existing as the sustainable way of living. The values and subsistence tactics of that kind of society might have been crystallised in their tangible and intangible heritage. The core of the traditional values can be transmitted to modern society through the adaption and reinterpretation of folklore texts, customs and practices. In the presentation it will be told about the experience to combine traditional culture and outdoor lessons at teaching the ecologic world view in the lectures, held in the autumn courses 2014, Tartu University. For my lectures I found much ideas from Estonian folk belief that has been an ideological base and unwritten „law“ for the traditional community. This old animistic religion has often been disparaged on one hand by the rational world view, developed in Europe since the Enlightenment, and on another hand, by Christianity, as being just the number of pointless or even dangerous activities. Anyway, despite of problems of misuse (that unfortunately come easily along with every ideology), folk belief has been the carrier of eco-friendly world view and ideology, it has had an impact on many human activities, including expressive arts. As people in Estonian traditional community lived close to nature, they were conscious of their direct dependance on nature and their attitude to nature could be interpreted rather in terms of partnership than domination or utilisation. Folk belief was the main ideology of traditional community that organised the relations inside a human community but also between human community and it's partner „nature community“. The basic values of sustainable development can be found in different folklore genres. Those values can be explained and exemplified through interpreting folklore. The choice of folklore genres and pieces for that aim depends on the age and the interests of students.

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Sustainability education in an ecocommunity school: experience of an Estonian ecocommunity

Riinu Lepa

One of the initiators of ecocommunity Small Footprint (Väike Jalajälg)

In the schools in ecovillages children are surrounded daily with aspects of creating sustainability. Learning is going on constantly for everyone in the community, be it figuring out new sustainable solutions for waste management, creating enterprises to serve the people not the other way around, searching ways for nonviolent communication or discovering the power of consciousness for personal coping, just to mention some examples. The boundaries are blurring: who are the teachers and who are the students, where is the “school” and when does it start/end, etc. The school becomes a concept, rather than an institution. The essence is to find your passion. The presentation introduces sustainability education in the schools in ecovillages, gives a summary of main lessons learned during the initiation of an ecocommunity school started in September 2014 in Small Footprint ecocommunity in Estonia. As well some suggestions will be presented on integrating sustainability in learning processes and the possibilities for cooperation with students and teachers from other schools.

FOLLOW THE ROAD OR LEAVE A TRAIL?

Session 3 23. APRIL
Sustainable Communities

Global Education and Education for Sustainable Development Intertwined – Experiences and Best Practices from Estonian NGO Mondo

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Global Education (GE) raises awareness on how we are linked to the world through consumption and politics and how everyone can change the world for better. It promotes socially, economically and environmentally sustainable world and active global citizenship. As education, it promotes not only cognitive skills but also values, attitudes and skills that are necessary for more peaceful, just, inclusive and sustainable world. For the past seven years the Global Education Centre of NGO Mondo has been promoting global education in Estonia. The centre offers materials, methods, workshops, school visitors, films, exhibitions, projects, school links and trainings to support schools in bringing up global citizens. Materials and projects link environmental themes with social and economic issues and vice versa. The centre regards as best practices direct links and joint projects between schools in Estonia and schools in developing countries, longer term in-service trainings for teachers, and using films and interactive methods in education. This paper/presentation discusses the status of global education in Estonia and argues that Global education and environmental education can jointly form a comprehensive model for Education for Sustainable Development in the Estonian context.

Teaching Social Entrepreneurship: Example of Armenian Mountain Communities

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Youth unemployment counts as one of the most urgent challenges in many European countries especially in rural areas and poses a serious threat to a sustainable rural development. Tatev is the village in South – East Armenia, where the youth unemployment achieved 80%. Social entrepreneurship is a tool how to create effective sustainable economic development. Support for social entrepreneurial initiatives in the education sector is now one of the priority, how to implement the idea of separate subject - social entrepreneurship. From 14 until 22 May, 2014 in Tatev, Armenia was organized Youth in Action project “Social Entrepreneurship in Youth Work”. In this project was used team based learning (TBL) approach. In this workshop participants were from Georgia, the Netherlands, Bulgaria, Latvia, Lithuania, Italy, Moldova and Croatia. Participants were divided in four groups, where they prepared proposal for development of social entrepreneurship. Youth workers and youth leaders actively involved in youth centres and/or in projects related to combating youth unemployment, especially in rural areas. Team Based Learning process was organized, including locals, which were part of the workshop. Participants also made virtual interviews. In this research was used observers methodology for teaching social entrepreneurship for youth leaders.

Solvik School. It's not about talking, but doing!

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While many people are theorizing about sustainability and creativity, teachers at Solvik in Sweden have been working decades to make it in reality. Starting from the late seventies in a Waldorf community about 50 kilometers from Stockholm in a most scenic Scandinavian landscape, there is a beautiful forests school near the seaside with 100 students built up by now. Solvik was established by the school community, based on collective leadership. Two floor eco-houses, mostly made of clay and other natural materials, were built as a united effort of parents, teachers and others interested. Firstly some ideas behind this work will be introduced ("Construction Letters" of Pär Ahlbom). The second part of the presentation will take a small tour at the school today, aiming to give a glimpse of the educational approach, and international cooperation that is going on (Intuitive Pedagogy courses). What is so special about Solvik? We serve only ecological food, often made of local products. The school is mobile free and computers are used rarely. Nature and outdoors are a natural part of every school day. Play as well as communication, are at the core of learning experience. Nearly half of staff are men, everyone working at the school are teachers. Thirdly I would like to co-imagine the future of the school together with the audiences.

www.solvikskolan.se <https://intuitivepedagogy.wordpress.com/>

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ESD in World Heritage Education (WHE) - a study of teachers conceptions and experiences of WHE in Kvarken Archipelago

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The responsibility to preserve our natural and cultural heritage is not just a national issue but also, through international agreements, an international commitment. Young people should be given the knowledge and understanding needed to conserve and manage the World Heritage (WH) sites for future generations. Environmental awareness and the general understanding of our environment can increase by studying natural heritage sites, the reasons for their significance, and the factors involved in their protection and management. The essential characteristics of ESD can therefore be implemented to WHE. The Kvarken Archipelago was inscribed on the WH-list in 2006. The natural heritage is situated on the West coast of Finland in the region of Ostrobothnia and possesses a genuine geological value since the rapid rate of the land uplift. The aim of the study is to investigate teachers' experiences of and views about learning in and about this site. Totally 104 teachers within basic education in the concerned municipalities answered a questionnaire consisting of fixed and open questions. A combination of quantitative and qualitative methods was used and data was analysed by SPSS. The open questions were categorised based on inductive content analysis. Teachers' perceptions coincide with UNESCO's guidelines. Namely that WHE, which is interdisciplinary, will contribute to increased understanding of the importance of protecting sites with a universal value. Though, a relatively large proportion of teachers were uncertain of how WHE can be linked to all dimensions of SD. The majority of the teachers considered that SD can be clarified by anchoring in local environmental issues and problems, a quarter were uncertain. The teachers are interested in WHE but their schools do not have enough resources to carry out the WHE they desire. They need support and the further development of WHE would be strengthened with a more distinct connection to ESD.

Project „Hello, Spring!“ – Over 20 years of Values Education through Nature and Environmental Education

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Our values and attitudes come from our childhood. Home plays an enormous role in the formation of attitudes and so does school and education. This concerns attitudes to people as well as to the environment. It is difficult to understand the environment if you do not know who lives there. In many cases we talk about species in nature that are rare and need protection, and less about common species around us. It is important first to get close to common species, start caring for life in general, and after that we can move to the concept of Sustainable Development. The project „Hello, Spring!“ (running since 1994) is teaching children to notice nature at home and in their neighbourhood through observing 34 most common plants, birds, insects and mushrooms that appear in nature during Spring. Participants learn to recognize birds by their song and plants by their blossoms, to observe and understand seasonal changes in nature. They enter the observation date into the online database and the results instantly appear on the web site, where they can be viewed by everyone. This makes it more attractive to children who are used to getting immediate response from ICT tools. It also gives teachers a structure for using ICT tools in a meaningful way in Nature Education. Over the last 5 years the participation in the project has been around 8000 students annually with 470 participating groups from schools and kindergartens. This is approximately 50-60% of all the 650 schools and kindergartens in Estonia. Nature education improves the quality of life by sharing human values. It helps to develop respect, honesty, compassion, care and responsibility. Through the activities of “Hello Spring!”, which carry all these values, quite a remarkable number of children learn important lessons on nature every year, and the development of their values and attitudes towards Life around us is positively influenced.

Investigating the effect of ESD-implementation in the Swedish school system by assessing students' sustainability consciousness

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The UN Decade of Education for Sustainable Development drew to an end in 2014. During this decade, numerous schools in Sweden have implemented education for sustainable development (ESD) as an explicit guiding approach in teaching. In this study, we investigate the effect of this approach on students' holistic viewpoint of sustainability in comparison with that of students taught in ordinary schools (REF-schools). Accordingly we introduce the concept of sustainability consciousness (SC) to represent the holistic view of sustainability. Within the concept of SC, we combine and investigate the environmental, economic and social dimensions of sustainable development in terms of sustainability knowingness, attitudes and behavior. A Likert-scale questionnaire with 50 items was developed and piloted to evaluate students' SC through a nationwide study of the Swedish school system. A total of 2411 students from the 6th, 9th and 12th grades participated. Half of the sample consisted of students from schools with an explicit ESD-profile while the other half consisted of students from REF-schools. The data was statistically analyzed using multivariate analysis of variance and univariate analysis of variance. The Cronbach's alpha value for the instrument was 0,903 indicating a good reliability. The results show that the ESD-profile schools had a small positive effect on the students' SC in the 6th and 12th grade, while in grade 9 the effect was negative. From the univariate analysis we can also see a fragmented effect of ESD-schools on students' views of SD. When comparing each dimension separately we can for grade 6 see significant ($p \leq 0,05$) higher recognition of the environmental dimension among students from ESD-schools. In grade 9 REF-students showed significantly higher mean values for the social dimension, while ESD-students in grade 12 recognized the economic dimension significantly higher. This study raises the question about the proficiency of current ESD-implementation in Sweden.

An education for sustainability dissemination program in Israeli schools: Changes in the schools and in student outcomes

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The study focused on the outcomes of the program of disseminating education for sustainability in elementary schools in Israel, which was framed and supported by the Ministries of Education and of Environmental Protection. The dissemination program consists of teacher professional development and support in constructing school-based education for sustainability programs that include learning in school, in the outdoors and getting involved in environmental action. The program was executed by two NGO's that carried out the professional development and the guiding of the teachers in their development of school-based curriculum. Our goal was to investigate the extent to which the program has yielded a change in the participating schools, in teachers' approaches and in students' environmental attitudes and behavior. Additionally, we investigated the students' performances in socio-environmental Issue tasks that required higher order thinking skills such as critical thinking, problem-solving and decision making. We interviewed 35 teachers and administered pre/post student attitude and environmental behavior intention questionnaire and a socio-environmental open-ended task. Our findings indicate change in the participating schools' sustainability approach and discourse, as reflected by the teachers. The teachers reported high level of enjoyment and high motivation to deal with sustainability in the schools. A small but significant improvement was found in the students' environmental knowledge, and system understanding of complex sustainability issues. No improvement was found in students' environmental attitudes and in their tendency to adopt pre-environmental behavior. The contribution of the study is theoretical, practical and methodological: it provides valuable knowledge on how a dissemination program contributes to implementation of the rather abstract idea of education-for-sustainability. I hope it will inform the two ministries on the outcomes of the program, and will add new instruments to the battery of research instruments in environmental-education.

Sustainable schools – a missing points

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Some of the specialists state that education for sustainability is a way forward- looking. It aims to do things differently in the first place, instead of just cleaning up the symptoms of underlying problems. 2014 is the end of the major UN initiative – the Decade of Education for Sustainable Development (DESD). There has been a lot of emphasis on the creation of documents, strategies and policies and committees to provide a formal foundation for ESD. Also a huge range of projects in schools, nearly all focusing on specific activities and action towards reducing consumption and increasing recycling have been provided. This of course is to be applauded. Policies and practical actions are key building blocks for classroom and learning change but can we say that we are successful ? Is ESD the vehicle that will take us to a better, sustainable world ? We can doubt this today. So what are the missing points ? This paper is based on long term experiences in ESD field and on research that was undertaken comparing the implementation of the DESD in two European countries - Poland and England and was structured to look at the approaches to and implementation of ESD in all the secondary schools of one region in country. It is aiming to undertake discussion about why despite all the political, organizational and financial effort relating to DESD implementation the gap between a policy and children's experience in the classroom is often never bridged. And why young people are great at switching off lights and saving energy and water in the short term, but don't apply sustainability ideas across their lives generally or in the long term.

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Education as Lived Experience - Food for Mind and Soul

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In a world opting predominantly for virtual living, the wisdom of humanity's collective experience as acquired through our physical, visceral and sensorial knowing seems to have become devalued. As one of the species inhabiting the Earth's living biosphere, humankind more than ever before, needs to reawaken to being a part of the complexity of the natural world, not being apart from it. This inter-relatedness can be explored through the dimension of experiential or lived education which re-engages not just the mind, but the deeper parts of that visceral, heart-led inner self. The sustainable human is one that can call on all parts of itself to face challenges and to embrace change. Surely Sustainable Education offers an opportunity to unravel learned mechanistic views of what learning and teaching are, in order to reconnect with our natural selves. The Findhorn EcoKit Project has worked with thousands of children and teachers in the north of Scotland and also from 2012-2014 in Estonia, bringing experiential learning to schools. It grew from the experience of the Findhorn Community, the internationally renowned Eco-Village, that has developed living education programmes that people come from all over the world to participate in.

Think before you Buy – Choose products with less hazardous substances. A teacher's handbook.

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We cannot imagine our contemporary lifestyle without chemicals, but we hardly ever think about all the chemicals substances surrounding us - where they come from, how they are made and are they safe for our health and the surrounding environment? Chemicals are either synthetically produced by man or occur naturally in the environment. Life without chemical substances is impossible because everything is made of chemical elements or chemical compounds. Therefore a claim that something is "chemical-free" is not true. The production and use of chemicals is growing, but it should be kept in mind that the production of chemicals and use should be accompanied by constant care and responsibility because of the possible negative impacts on the environment and human health. Although the producers of chemicals are becoming more responsible and there is legislation which controls and regulates the use and production of chemicals, we as consumers have a very important role - our consumption behaviour and choices give a direct signal for the producers about what kind of products we buy and what kind we don't. We as consumers can create a demand for products with less hazardous substances and the producers need to adjust to in order to stay competitive on the market. Today a lot of consumers are knowingly choosing products with less hazardous chemicals, but the awareness and knowledge needs to spread to the majority of our society. Changing environmental behaviour and changing consumption patterns is a very long process and takes generations, therefore young people – children, pupils, teenagers, are an important target group, because their behaviour habits are still developing and they are most susceptible to new information. The aim of the presentation is to introduce the teacher's handbook about hazardous substances and share first experiences from schools. It is intended to be used as a practical tool to raise the awareness of youth how we may be exposed to hazardous substances in our everyday life and how our everyday choices affect our health and the environment we live in. By integrating the topics covered in this handbook into different school lessons we aim to improve the overall environmental behaviour and change the shopping habits, so young children grow up with the knowledge to consume less and choose products with less hazardous chemicals.

Global Education workshops for non-formal learning in the Youth Sector

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Global education aims at raising awareness and at strengthening citizens' capacity to take action, advocate for their rights and take part in the political debate for global social justice and sustainable development. It encourages learners and educators to work cooperatively on global issues and it enables citizens to understand the complex realities and processes of today's world and to develop values, attitudes, knowledge and skills. During an international project "Youth of the World" (<http://youthoftheworld.org/>) six topics in six European countries (in Estonia: MTÜ Mondo) were selected and relevant educational methodologies developed that embody at least one of the following: reflection on own impact, dialogue, experimentation, gaining insights, developing empathy and solidarity and social change. In this project Global Education is seen as a vessel of taking up global issues such as consumerism, sustainability, social justice etc with youth, blended with non-formal education at youth work / youth organizations. Key outcomes in Estonia as of early 2015: · Six methodological sets (handbooks and photos) for youth workers and youth organizations have been translated and published on the topics of chocolate, meat, water, tobacco, textile and electronics. · An ongoing experiential learning approach training for around 20 youth workers (8 days covering a year since Fall 2014). · Around 30 global education workshops partly or fully following the suggested methodology, usually 2-4 hours single events have been held at youth centres, schools and youth organizations. · A growing 20+ members network of youth workers interested in global education with their own code of ethics, shared web space and facilitated reflection (online and during seminars). The workshops delivered to youth fall under a mix of cultures of education, the values of non-dogmatic dialogue, hope and eliciting self reflection and action are emphasized. The workshops have had a good reception as interesting and engaging.

Practical tools for understanding nature

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The best way to educate people about nature is to take them out, into nature and spend time, share experiences and explore. However, it may be complicated, especially with school groups during the vegetation period in our latitudes, as only May and September are suitable for outdoor activities. Therefore it is sometimes helpful to bring some of the nature into the classroom, still giving possibilities to explore. The two portable exhibitions-ecology tools "Peatbox" and "Coastal Meadow Box" are made for schools and nature centres resulting from 15 years of experience in classroom teaching and leading outdoor lessons, camps and excursions, both for children and grown-ups. There are certain gaps and misunderstandings of population about the processes and roles in ecosystems, probably in every country. Based on my experience, in "Peatbox" I tried to create the materials, which emphasise on certain aspects of peatlands, peat formation and usage. The short video, peat samples, peat product examples, herbarium, schemes about ecosystem functioning are supporting the teaching and learning. Schemes and worksheets can be used in field situation or in nature centre or classroom. The "Coastal Meadow Box" is similar, but focusing on dung and decomposition chain, which is difficult to understand and explain. Videos about dung decomposition and invertebrate life, domestic animals and their browsing habits and coastal meadows in general, dung samples, herbarium, dung insect collection, schemes and worksheets are useful both for teachers and children and also other visitors of the nature centres. The study materials' worksheets, schemes and videos are available in internet as well and everybody can use them freely. The physical objects are based in different nature centres and nature schools, but can be borrowed. It is important to have some real things in their real size and shape available in classroom and nature centres, not only internet based materials.

Practical education with “Home from Earth”

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Estonian educational system benefits from practical activities and connection to real life. To reach that goal, we have developed a Sustainability Education Tool to promote experiential learning - “Model Earth House Kit for Schools”, a hexagonal model of a natural house that enables to connect to the topics related to sustainable development. It also supports the development of student competencies in the field of natural sciences. Model Earth House Kit for Schools” enables students to engage in experiential learning, while integrating mathematics, science and technology, social sciences as well as basic values to the whole learning process. The tool can be used for different age groups but the present methodological instruction added to the tool is designed for grades 7-9. The set consist of recycled wood components for the house, also other necessary materials like twigs, clay, sand etc. The house is equipped with miniature portable power station, solar panel and measuring tools. While constructing the house, students learn about traditional building materials, low-carbon societies and ways to improve the indoor climate conditions by using traditional construction methods. Diverse measurements can be done during the construction e.g. temperature or electrical measuring. Discussions related to ecological life-styles are integrated to the tasks. The whole process can be enhanced by teacher creativity. The tool was designed by Social Enterprise Equilibre in co-operation with Tallinn University and specialists of the field of sustainable development. The project was financed by the Environmental Board of Estonia.

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Teach the Future

Erica Bol, The Netherlands

In order to get the next generation to recognize the importance of sustainability and proactively engage in changing the world it is to teach them the future. We propose that teaching the future encompasses teaching how to anticipate and manage uncertainty and ambiguity. Moreover it is critical to master the basis of change, that is, to understand that change is unavoidable and that thinking about the future allows us to proactively create more preferable outcomes. Although it is hard to teach the future because it is not here yet, we should teach the future like we teach the past. The better prepared you are, the more you can give direction to your own future and that of the world.

Creative cross-curricular performance-project for climate change education

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Climate change should be approached not only with traditional, rational, analytical or mechanistic ways of teaching, learning, knowing and seeking change. Climate change education calls for social and holistic learning processes, which apply artistic, embodied, experiential, symbolic, spiritual and relational processes of learning. Climate change challenges the relationship between adults and young people and needs adults and children learning, creating and acting together for a better future. In this presentation the potential of drama education for climate change education is reflected on both onto-epistemological and practical/empirical level. The potential of drama as a method for learning for climate change education is exemplified with a cross-curricular performance project about climate change conducted with an international class of 13-14 year old students. This case study is a part of an ethnographic work based research project about applying the methods of drama for climate change education. In the collaborative performance-creating process the participants were emotionally involved and actively participating in collaborative creative process of social and aesthetic transformation. The participants reflected the prevailing emotions and attitudes about climate change in both the personal and the collective meaning making process about climate change. In the creative collaboration practice the students and the teacher were together learning successful collaborative practice and constructing possible future solutions. The students test their possibilities to influence and their ownership of the performance by resisting and criticizing. Conducting an ensemble in performance creating, demanded a special pedagogical attitude: readiness for an open dialogue with students, transformation of the teacher's role and a willingness to adjust to the process of learning.

Integrating environmental subjects into language studies

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According to 2014 data from the Statistical Office non-Estonian population makes up 30,9% of Estonia's population (<http://pub.stat.ee/px-web.2001/Dialog/Saveshow.asp>). Command of local language is one of the preconditions for the better understanding of local life, but also nature and environmental issues. Thus we can say that command of language is a key for higher environmental awareness for a big group of people in Estonia. School has an important role in development of language skills of young people, so as providing environmental information to them. Integration of different subjects at school is an efficient tool to teach language, give environmental information, and finally shape (environmental) behaviour habits of the young people at the same time. In Estonia two school networks with different languages - Estonian and Russian - have been existing side by side since Soviet period until today. Since 2007 the Russian language upper secondary school is going step by step to state language. However, the most effective way to acquire foreign language is to start in early childhood. There are certain methods developed for teaching people with different mother tongue from state language. Content and language integrated learning method is one of them. A project team lead by Association Etalon offered learning texts to the study materials, providing in this way to the learners environmental information. 10 Estonian teachers have compiled their experiences into an applied handbook for the teachers working with the Russian-speaking students. Handbook offers ways to integrate the studies of biology, chemistry, environment, and the Estonian Language in the upper secondary school. Handbook comprises lesson plans of 34 different topics, including theory, applied exercises and methodological tips. For teaching Estonian language for the Russian-speaking children in pre-school the project team developed entertaining posters and active methods on four environmental topics: water, waste, nature protection and energy. In this way the kindergarten children have fun and learn language at the same time.

How do we go fostering creativity and sustainability in Secondary Science curriculums? Case study in Ghana, Nabdam district

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How do we go fostering creativity and sustainability in Secondary Science curriculum? Case study in Ghana, Nabdam district In recent decade, creativity has been seen as a mean with which to solve social, political and economic problems facing the twenty-first century (Robinson, Minkin, 1998). Every society that wants to solve problems, create new products or invent new processes need a surplus of creative people who are going to think and work indicatively (Florida, 2004). Western Education policies emphasize the importance of creativity as a key to economic success and personal fulfillment (Craft, 2005). For example Estonian Lifelong learning strategy states that the most important goal of education is to apply individual and social development supporting, creativity and leadership skills developing study approach in all of the educational levels. Ghana is still struggling to come out from the industrial educational model, where multiple learning pathways are not the mainstream practice and authoritarian model is being used. How in this educational settlement one can foster creativity and innovation, the most important components leading to sustainable future. I will be spending 3 months in Ghana to work with the heads of Schools and Science teachers to promote creative methodologies. Intensive sessions with teachers and heads will be carried out and lessons will be observed. Creative Science teaching should be viewed as disciplined improvisation, that acknowledges the active participation of students including opportunities for inquiry-based learning, constructive, project-based learning and collaborative learning. It emphasizes negotiation and collaboration in inquiry (Sawyer 2004). Researchers have outlined that creative Science teaching requires an openness to experience, a willingness to take risks and

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Highlighting the value prototyper of modern young people in the context of sustainable education and development

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Currently the society is dominated by the social and cultural aspects that make people believe they are the only stable element in their lives, since such elements as work, family and personal relationships have become unstable. The notion, that comes to the foreground is the one that of one's own special, unique, individual course of life, alternatives of choice, choices that have to be made, and consequences that may occur as a result of choosing a certain alternative. The new model of life is more dynamic. One is in need of a skill to deal with the unknown, the unpredictable, in addition to planning and organizing a person must be open to unexpected opportunities. Choice, future plans and intentions are based on values and opinions, outlining a course of sustainable development. Seeking of young people's values becomes essential. The modern young person has found other, more topical goals corresponding with other value prototypes. Along with the shift of paradigms, education conception and policy provide for a determined human's sphere of activity where the experience of humanity, society and an individual – knowledge, skills, attitudes and value-orientation in terms of the human him/herself, the human environment and nature – is particularly collected, maintained and distributed. In the aspect of this formulation education is an intellectual need, an action, the result of which may be expressed in the form of intellectual value. Education has to assist people in maintaining and developing attitude towards values, intellectual values. The value-orientated approach is based on the principle of holistics. It embraces all the broad scope – from the highest objective intellectual values to actions of analytical nature. The overall process of upbringing and education will be value-oriented only in case if we can implement the principle of wholeness or holistics. And since each young person has own individual measure of this wholeness, the research of value prototypes is needed.

Finding roots in all globalising world. Value education of national identity

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Surveys from the year 2013 show that in case of invasion, 1/5 of Estonians are ready to leave Estonia, 6% are sure to leave and 14% would do it probably. As globalisation is spreading more and more, we can be quite sure that most children that are right now living in Estonia go to study or work somewhere abroad at least for some time in the future. How can we be sure, that our nation would not die out? How to retain our identity and deep national values? How important are roots in global view? How to teach Estonian national values today? As an experienced values trainer and folklorist from background, I will discuss about teaching values through our traditions and how to make folklore interesting for the 21st century children. I have worked out a novel value education methodology - the Wiseness Jar Methodology - that concentrates to the idea of how to teach children from 3-10 values through positive Estonian proverbs and folkloristic materials. I worked out this methodology three years ago and it has been quite popular among Estonian kindergarten teachers and also some elementary school teachers use at least some parts of it. It gives ideas of how to use folklore in modern ways and how to make it natural part of everyday living, how to stand up for americanization (e.g. Estonian Mart's Day versus Halloween) I can share many practical ideas through pictures, how the Estonian nations values have been taught, some conclusions about this methodology and teachers' feedback. Our roots are important for personality development and values can be trained. We can hate the country where we live and we can deeply value its culture and richness. All this is a matter of value choices.

Why should they care?

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The aim of this presentation is to discuss the possible role and impact of non-formal environmental education on the value judgements of young people. The ideas are supported by examples of everyday teaching practice of environmental education specialists of Environmental Board in Estonia – a team of a mini-bus which has been rebuilt for the purposes of environmental education. Does the increase in world population influence our life in Estonia? Should we care about the rainforests being cut down or about the amount of fossil fuels being burnt, which may cause dramatic changes in our climate system? Could we be happy to consume so much, although there is a lot of poverty and not much equality or human justice in the parts of the world where the products are made? These are some examples of questions we ask teenagers in our workshops about energy and environment, which we organise to help schools with cross-curricula approach. We attempt to touch the students' values and offer practical tasks and vary our teaching methods in order to create connections between the students' own lives, their communities and other peoples in different parts of the world. We speak about our thoughts and attitudes and encourage the students to share theirs to find something in common to be used as a starting point in our discussions about sustainability. Despite the fact that we only meet these students for a limited time, we believe that by offering an alternative approach from outside school and trying to build on students' current values and previous experiences we can help to shape their values so that the decisions they make will be influenced not only by the knowledge or facts they have learned about the world but also by care and responsibility for future generations.

Explaining the prevalence of environmental values in European countries

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Human values play a central role in engagement with sustainability ideas and practices. The prevalence of environmental values as guiding ideas has changed over the past decade in majority of European countries. The drivers of changes in environmental values have remained largely unexplored, particularly in Eastern Europe. Beliefs about environmental processes, e.g. understandings about adverse environmental impacts on human health and ecosystems have been related to value orientations (value-belief-norm theory). One rationale for this is that a value orientation engages a top-down process that biases individuals to select and believe in information that is congruent with the value orientation and to deny value incongruent information. We test this rationale by exploring the extent to which a prevalence of a value orientation - care for nature – in a country is related to the general level of understanding environmental processes. We use the OECD data on PISA Science test results as a proxy measure for general levels of awareness of environmental processes in European countries. In addition, we use the individual level characteristics (European Social Survey data), macro-economic and environmental parameters (environmental performance index, Yale Centre for Environmental Law and Policy) as background parameters to predict the care for nature. We demonstrate that the general level of awareness of environmental processes is indeed a strong predictor of the prevalence of environmental values.

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The Role of Urban Green Areas in the Education for Sustainable Development - Focus on Kraków, Poland

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The comparison between four selected green areas in Krakow (Southern Poland) is made. The green areas include: 1) the historical centre of Krakow with the surrounding green belt, called Planty, 2) the open grassland situated near the city centre, called Błonia, 3) the park situated between the old part of Kraków and the industrial district of Nowa Huta called the Park of Aviators and the grassland area in the industrial district of Nowa Huta, called the Nowa Huta Meadows. All the areas have great potential educational values, because of the richness of nature and historic values. All the four aspects of sustainable development - environmental, economic, social and well-being are important in the management of these areas. The environmental aspect is related with preserving biodiversity and filtering the pollutants. The economic aspect is connected with the projects that carry out profits and can be carried out in these areas, as well as in higher value of real estates situated near green areas. The ability to spend time in nature without spending much money for the travel also belongs to economic aspects, but also social and well-being aspects. The areas are attended by the residents of Krakow. The educational value of green areas is related with the ability to observe nature (e.g. birdwatching) as well as formal and informal meetings and sports and recreational activities allowing social integration in many fields. Some meetings have strictly environmental character, like a meeting dedicated to recycling to mark the Day of Earth. Some of these objects are covered by formal forms of protection as the ecologically useful areas (the Nowa Huta Meadows) or registered historical monuments (Planty, Błonia). The history of the objects will be presented focused on their educational role. The results of the interviews and questionnaires among the visitors of the areas will be presented. They will be asked to assess the areas in various aspects, such as accessibility, nature, infrastructure, etc. Visitors' understanding of the principles of sustainable development will also be examined.

Small Businesses in Creative Quarters as Educators for Sustainable Development: Case of Riga

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Nowadays people do not want to be taught. They are eager to explore themselves and come to their own decisions. Therefore we wanted to find how people could discover sustainable living practices without being obviously taught. This study is about finding educational impacts of sustainable business examples in Riga. During the economic crises in Riga appeared several Creative Quarters. We studied one of these Quarters – Miera Street (Peace Street). Small businesses located on Miera Street represent many sustainable living practices. There is small designer shop which is selling used designer furniture of the 20 century, craftsmen's workshop which produces design products like glasses, candlesticks or snack trays from recycled glass bottles, handicraft boutique, which offers handmade goods from Latvian sheep wool and sells their products also on internet. These are just few examples which have been studied. The aim of this research is to find out and define educational impacts on sustainable lifestyles from small and sustainable business examples to inhabitants and visitors of this Creative Quarter. As research methods we used single case study, interviews and observation. We found that there are number of indirect education for sustainable development impacts on people who visit this Creative Quarter. To mention most important of them: develops sense of community on the particular street, facilitates next activities towards more sustainable living, promotes Latvia as green country brand between tourists, gives opportunity to people practice sustainable living in real life. All these results are obtained because of the development of the Creative Quarter. At this development stage this Creative Quarter provides the educational and awareness rising impact, but future research has to be done because of the changes and possible development problems of creative quarters mentioned in the scientific literature.

Educational inequality as an example of unsustainable use of human resources

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Sustainable development of human resources includes availability of adequate education and developing people's talents regardless of their social origins. Contrary to widely held belief that due to the increasing availability of education the upward intergenerational mobility is on the rise all over the world, the findings in Eastern European countries show that the decline in intergenerational mobility is the case in some countries. The present study examines the relationship between people's social origins and educational pathways in Estonia using data from three recent surveys: The Estonian Survey of High School Graduate's Educational Preferences (N = 1201), Eurostudent V Estonian data (N = 6418), and European Social Survey (ESS) Estonian data from rounds 2, 3, 4, 5 and 6 (N = 9340). Results of Eurostudent V suggest that parents' (especially mother's) education level is important predictor of the student's HEI choice in Estonia. Analysis of the ESS data confirms that mother's education is stronger predictor of the child's educational level than father's education in Estonia. The study of the high school graduates reveals that the education level of the parents is somewhat better in Estonian language high schools than in Russian language high schools. Therefore, social and ethnic origins influence educational outcomes in Estonia and talents of some young people may not be developed just because they come from a wrong family. While the studies on high school graduates and students allow us to analyze the relationship between social origins and educational choices of young people who have recently made important decisions about their educational pathways or who are about to make these choices in the nearest future, the ESS data enables to put these results into historical context and to test whether the importance of social origins has increased or decreased in Estonia in past decades.

On board - an action programme to advance environmental awareness and responsibility in the Uusimaa region of Finland for 2014–2017

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The on board Project has drawn up an action programme to advance environmental awareness and responsibility in the Uusimaa region of Finland for 2014–2017. The goal of the programme is to mainstream good practices relating to environmental awareness and responsibility and to promote cooperation and networking as well as sustainable production and consumer practices. An additional aim is to support businesses that take on board environmental issues and responsibility and to promote sustainable business practices. Over the time of the Project, environmental responsibility indicators to measure the impact of this work have also been developed and assessed. The action programme has given substance to the regional strategies and programmes for the parts concerned with furthering environmental awareness and responsibility. In addition it has set a course for the coming years' activities of Välke, a collaborative group of environmental educators. Good practices for the promotion of environmental awareness and responsibility are spreading, corporate environmental responsibility is on the rise, the demand for environment-saving products and services is growing, and it has become easier to assess and follow-up on the impact of measures for promoting environmental awareness. The Project is implementing the Finnish Government Programme objective "to develop Finland into the most environmentally conscious society in the world", while at the same time developing methods and regional benchmarks for how progress towards that goal will be tracked. The Rattaila Project was coordinated by the SYKLI Environmental School of Finland. It was carried out as a collaborative project by members of Välke. The primary sponsor was Uusimaa Regional Council, while additional Project implementation and funding was provided by the Ministry of the Environment, the Uusimaa (ELY) Centre for Economic Development, Transport and the Environment, and the region's major cities as well as other public and private actors of importance in environmental protection.

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Introducing ESD in higher education in the Baltic Sea Region - challenges and drivers

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Networking and internationalisation improve the opportunities and critical mass for partnerships in projects, and so provide a platform to widen the educational offer and develop new areas such as sustainable development. Dedicated university networks also offer to their partners activities such as common seminars and courses, competence development and institutional change. Networks can also function as platforms for individual contacts at all levels, including students and teachers. One example from our region is the Baltic University Programme (BUP) network which has supported the introduction of sustainability in education, research, and management, and where researchers, teachers, and students cooperate at a macro-regional level. Internationalisation and development of education for sustainable development have been guiding principles of the BUP network. New learning materials and methods have been developed in a wide cooperation among the institutions of higher learning. In addition, many projects have been run in cooperation with cities and authorities, and through which new learning materials have been produced for all partners. Also the university leaders, rectors and vice chancellors, meet regularly with the aim to enhance the institutional cooperation in the Baltic Sea Region. The BUP network has more than 200 member institutions of higher education, and it cooperates in projects with cities and other stakeholders in the Baltic Sea Region. The BUP is a strategic partner of the Council of Baltic Sea States, and a Flagship project under the EU Strategy for the Baltic Sea Region to support enhanced university cooperation in the region. The presentation will give an outline of current challenges for universities, their teachers as well as their students, and mirror these challenges through the principles of education for sustainable development.

Story of my 12 years experience on teaching ESD

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I have been giving an ESD to course open to all the university since 2002 in the Middle East Technical University, Ankara/Turkey. The number of students enrolled to the course increased each year and now I have given the course as two sections with almost hundred students for each section. The possible reasons for students' interest in this course are twofold, because "sustainability" is a very popular concept and they want to know about it and also because they interested very much in the real stories in the context of the course related to sustainable and unsustainable situations in all over the world. The stories are such that after each story students are expected to see themselves as one of the actors in the story and feel the responsibility of the situation. The expectation however, was tested by means of essay home-works given to the students. Content analysis of those home-works has lots to say about, for example what sustainability means to university students? How seriously they take it? Besides, we as educators have lots to learn about what students have written, for example, what do we need to help our students live their lives more sustainable and meet the enjoyable side of life? , how we give the bad news that nature has a receiving capacity and we have exceeded it, without making them desperate about the future?, what are the real stories that impress students in terms of feeling responsibility and acting sustainably? Therefore, this presentation will be on the answers of these questions depending on the 12 years of ESD experience and the results of content analysis of essay home-works of 170 students attended the ESD course during the fall semester of 2014-2015 academic year.

Sustainability of interpersonal relationships in educational context: possibilities in teachers' training

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Sustainable development is often seen in the context of environmental resources: water, earth etc. Yet, the mental environment of human beings is loaded with increasing amounts of information, and the nature of interpersonal relations is going to change due to rapid development of communication technology. These processes raise several problems about social, informational, and media competency of different generations, e.g. students and teachers. Ability of critical reading and thinking is more and more crucial for making informed choices, yet the speeding information flow cultivates superficiality of reception processes. Adults and young people have a lot to learn from each other, but in many cases the pedagogical relationships are damaged because of generation gap in social competences and media literacy. In the University of Tartu, changes of teacher education are targeted towards teachers' ability to create a sustainable pedagogical relationship. In my presentation I will introduce the methodology of communication training in the context of academic education. Based on the principle of sustainable relationships, the team of scholars and practitioners has created a course that helps student teachers to develop their basic communication skills: listening, asking questions, noticing multimodal aspects of communication act, negotiating, dealing with resistance, moderating, etc. Training communicational microskills helps teachers to be more exact in each communicative episode, and thereby support sustainable relationships with pupils, colleagues, parents, and general public. Still, since the information environment is changing rapidly, the basic communication skills must be adopted into mediated communication forms as well. Experiences of two years innovative teaching and learning allow us to claim that ability to create and maintain sustainable pedagogical relationship can and must be trained as well as other pedagogical skills.

What does it take to reroute a tanker? Lessons learned in 25 years of innovative teaching in environmental and sustainability sciences at the University of Lüneburg (Germany)

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To date, the implementation of sustainable development poses one of the greatest challenges to mankind. For universities as traditional social institutions in knowledge production and distribution the complex and multifaceted problems of unsustainability constitute a challenge in research, both in terms of fundamental situational analyses and with respect to the search for appropriate solutions. Commitment to the guiding principles of sustainable development also entails rethinking of teaching and learning towards a problem-oriented balance of specialized expertise versus inter- and transdisciplinarity. Not to mention the organizational management of the universities themselves. Few universities have embraced the challenge of sustainability in a holistic way so far. The Leuphana University of Lüneburg was one of the first European higher education institutions following a systemic view of sustainability-oriented transformation. Since the end of the 1980s research and teaching at the Leuphana University have systematically addressed matters related to the environment. In 1996, in line with the increasing importance of environmental and sustainability issues the university established the Faculty of Environmental Studies, which then was changed to Faculty of Sustainability in 2010. With its projects

“Agenda 21 and University of Lüneburg” and “Sustainable University” as well as the UNESCO Chair “Higher Education for Sustainable Development”, the Lüneburg approach was a way of seeking to envision itself as a holistic system. By addressing both didactic and structural questions, this contribution showcases how Leuphana University tries to cope with the sustainability challenge with regard to teaching and learning. Examples stretch across unique educational approaches like the “Science bears Responsibility” module that is obligatory for all undergraduate students in their first semester, addressing questions of sustainable development in a variety of contexts. This cross-disciplinary approach is then taken further by the Complementary Studies Program. No matter what major a Leuphana Bachelor student may be studying, s/he is enabled to encounter and critically engage with unfamiliar scholarly modes of thought, in order to understand how different disciplines pose questions and find answers in many sustainability initiative contributions. Examples of graduate and PhD study programs complete the picture of Leuphana’s pathway towards higher education for sustainability.

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Philosophising with 3 to 12 years old children in Estonia

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The programme Philosophy for children (P4C, according to Matthew Lipman (1977)) has reached Estonia in the year of 2001. P4C, in Estonia called as a method philosophising with children, is a method of teaching to guide discussion, which develops children's linguistic capabilities, and social and cognitive abilities. The main aim of the presentation is to share experiences about the implementation of the method philosophizing with children in Estonia. But also describe the topics of philosophical discussions, and provide examples of teacher's questions and children's answers. The presentation will give answers to the following questions: How did the children of Estonia liked an innovative approach: philosophising with children, in the opinion of teachers from training course? Which is the readiness of teachers, who has completed an 8-day training course, to implement the new method in learning process? Which are the circumstances that make it difficult to implement philosophical discussions weekly? The topics of everyday life are motivating children to participate in philosophical discussions. Teacher's questions guide the children to think independently. Suitable atmosphere and a neutral attitude of teacher encourage children to express their opinion. Both children and teachers enjoy the process of philosophical discussion. Teachers have shown great interest to implement philosophical discussion regularly in everyday learning process. The results show that there is a hope that in the future the number of teachers in kindergartens and schools in Estonia is significantly bigger who are able and willing to guide philosophical discussion. Referendes Lipman, Matthew, L. (1977). Philosophy in the Classroom. Institute for the Advancement of Philosophy for Children, Montclair, New Jersey.

Understanding sustainability: between renewable resource and linguistic puzzle

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Education for sustainable development suffers a lot because of a certain understanding gap caused by scientists disregarding ecological economics. Ecological economics wants to harmonize and combine ecological science with economic analysis. And, in particular, it is economic wisdom dealing with exploitation of renewable resource which is lacking in numerous studies addressing philosophy of sustainable development. This leads to a very unfortunate situation because popular interpretation of sustainability is omitting fundamental aspects connected with strong and weak sustainability, and first of all is disregarding substitution issue. Therefore, the crucial phenomenon of long-lived existence and perpetual benefits from properly managed renewable resources seems to be underestimated or misunderstood. The core elements of sustainability issue and its logic are: not-disturbed functioning of biosphere and its existence in an infinite perspective. The existence of human being and continuation of its civilization need effective and stable economy, fair society, and healthy nature. All these three spheres are important but only exploitation of renewable resources gives us a perfect hint how to proceed to avoid permanent depreciation of natural capital. Last but not least, economic category of "sustainable yield" applied to the management of renewable resources has been actually introduced by economist Samuelson many years before Bruntland Report announced to the world the new concept of sustainable development. The first part of the paper refers to the theory of management of renewable resources. It includes theoretical generalities which are important for sustainability concept but also suggests some practical warnings delivered by C.W. Clark in his seminal work. The second part of the paper underlines the role of language. Sustainability has to be translated into national languages all over the world. The specific case of Poland shows very clearly that voluntary translation can harm very much and creates some very misleading interpretations.

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A private primary school was established in Estonia in summer 2014 and from September 10 pupils are studying at Gaia School (Gaia Kool) that is based on the ideas of Gaia Education. Gaia Education promotes a holistic approach to education for sustainable development. The basic principles are encompassing the four primary dimensions of human experience - worldview, ecological, social, and economic aspects. Gaia Education curricula is consistent with the key values values that include: honouring unity through diversity, celebrating diverse cultures and creeds, promoting social justice and environmental awareness, empowering individuals and local actors, raising consciousness and human potential, and, generally, respecting the living Earth as our planetary home. The idea of establishing a new school was born 3 years ago in the heads of the people who attended Gaia Education-based course in Estonia. After 8 months of preparations of the documentation, Gaia School was opened in August 2014. Our school curricula is based on the state curricula for primary schools. At the same time we follow the values and principles of Gaia Education in everyday school life. Our school year is based on the calendar of Estonian national traditional events. Every month we celebrate a traditional party with parents and children. The calendar gives for each month a topic which connects together the content of different lessons. Studying folklore has an important place at our school. We use the principles of learning through practice. Almost every week we go hiking, picking mushrooms, visiting open air museums etc. A lot of lessons take place outdoors. The small size of classes gives us possibility to have individual approach to every child and to support opening of everybody's talents. The first semester has been an adventure which has given us a lot of experience. A long and interesting journey is ahead.

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Teaching-learning divide in education for sustainable development and a way out

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The definitions of education for sustainable development usually emphasise the acknowledgement of the responsibility of individual's knowledge, attitudes and skills in world's ecological condition. However, in my presentation I abandon this emphasis. Instead of skills of empowerment, critical thinking, reflection and planning that are developed in relevant teaching processes I stress the role of practical socialisation in learning – tacit observation and embodied imitation in order to become a member of the communities of social practice. My presentation follows the ideas of cognitive anthropologists Lave and Wenger (1991/2003) and Lizardo (2009), who stress that human practice is built upon embodied know-how and is not easily transmitted by practices of linguistic interaction or other common ways of representation that are used in education. They claim that knowledge and skills are not cognitively internalised, but based on observation and imitation of the conduct of other people. The ideas of Lave and Wenger pose a question, how much should education for sustainable development focus on 'saving' new information in a learner's head and how much it should focus on co-participation of practice that is in accordance with the idea of "sustainability". For example, William Hanks (2003, p. 24) claims that learning is not about coming to know the world, but about being in the world. Usually the practice of education can be described by disruption of the ordinary flow of daily routine, changing the context of conduct, specific scheduling, coffee breaks, and rituals of entering and closing. The practice of learning, on the contrary, can be characterised by unorganised and unacknowledged imitation of more skilful members of the practice community (road users, pupils, shoppers, educators). My presentation discusses the teaching-learning divide and exemplifies the idea of situated learning in the example of two vignettes from the practice of education for sustainable development.

LYKE – network helping Finnish schools with their ESD

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One out of ten people spends his/her days inside school buildings. It is meaningful to the society both because of the negative and positive impacts on the environment. Nevertheless the school institution isn't very successful in promoting sustainable lifestyle. We need new creative standpoints to release the great potential of schools as builder of sustainable society. The nationwide network called LYKE was gathered in Finland during the past few years. It supports nature- and environmental education at schools and early childhood education. There are sixty members in the network by now, and the overall aim is that every kindergarten and school in Finland have a possibility to get professional help with their nature- and environmental education in the future. Members of the network are nature- and environment schools, the visitor centers of national parks, youth centers and camp schools. Members offer pedagogical nature/ environment school programs for groups from schools and kindergartens. There are also training courses for teachers. Programs and trainings provided by nature schools are designed based on the national curriculum. Learning is experimental, experience-based, hands-on learning in authentic learning environments. In the workshop Niina Mykrä, the executive director of The Finnish Association of Nature and Environment Schools, will tell about the LYKE-network and theoretical framework of promoting sustainable culture at schools based on her dissertation research which is going on. The approach is situation-centered. What is the wedge (successful practice), and what is the crack (situation) where the wedge could be gently hammered to widen the area of sustainable practices? Which are the stones we should first take off our way? How can somebody from outside of school, like LYKE-network, help in this work? After theoretical aspects Nature school teacher Jenni Skaffari will tell how the work is done in practice in Tampere Nature School.

The Mission

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The Mission has been used and developed during a long time-span, both nationally in Sweden and internationally. It is a tool and pedagogic approach for teaching ESD (Education for Sustainable Development) for audiences from lower secondary to university level. In my presentation I will demonstrate a short manual for how to use it, an overview of common results and learning processes and how these are linked to recent research on desired competences for ESD. The participants will receive a written abstract of the Mission together with a PowerPoint.

Key words: Systems thinking, Competences for ESD, learning processes, collaborative learning.

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From sustainable design to sustainable implementation: knowledge supply chains for a green economy

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EU has set sustainable growth as a goal for 2020, by which time the transition to a more resource-efficient, greener and competitive economy should be achieved. This requires new skills in the workplace. The European Centre for the Development of Vocational Training has studied the skills needed for a green economy in Europe. They have identified a need to integrate environmental expertise into the existing professions. One suggested action for technical and vocational education and training, in the Global Action Program for Education for Sustainable Development post 2014, is to respond to the need for greater clarity in defining the skills and competencies needed for green jobs. SYKLI Environmental School of Finland has realized a project concerning how vocational education and training may serve as a promoter of a green and low-carbon economy. Based on the results a need has been identified to review the education conducted in Finnish universities of applied sciences (also called polytechnics), as well as what skills are needed for different fields based on working life. We will survey the content of educational programs and continuing education in Finland and Europe. We will examine curricula presented on the websites of the educational institutions, conduct a survey and choose ones that will be examined closer by conducting interviews. In addition, we will develop knowledge supply chains for a green economy on selected themes: for example, in planning, sales, maintenance and after-sales services. The development of the knowledge supply chains for a green economy will be done in cooperation with stakeholders in the field. We will also identify how well the current education and training respond to the skills identified as the main development needs for education and training. Based on the results, potential bottlenecks in the knowledge supply chains may be identified.

Finnish and Swedish ninth graders' perceptions of climate change

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Mitigation of climate change will be one of humankind's greatest challenges. Adequate knowledge is vital for a person to start acting in an environmentally friendly way. The schools' climate change education (CCE) plays therefore an important part in the mitigation of climate change. The purpose of the study is to learn whether different school traditions affect students' knowledge of and attitudes towards climate change and thereby evaluate if the current CCE in both nations is appropriate. Totally 777 students (425 Finns and 352 Swedes) from 9 schools in Finland and 7 schools in Sweden were tested using a questionnaire with both closed and open questions. The schools were randomly chosen, but different areas in both nations were chosen to ensure a geographic spread. Data from the closed questions was analysed in SPSS (e.g. using t-tests, ANOVA and Pearson correlation) and data from the open questions was categorized by using a material-based content analysis. The majority of the students in both nations considered climate change to be caused by humans, but many misconceptions were present. Students considered climate change to have a negative effect on species and on human health but not on their lives. To mitigate climate change the majority was only prepared to do things that didn't affect their quality of life negatively. Swedish students had significantly more knowledge of the causes and had more hope that climate change can be stopped than Finnish students. Significantly more Swedish students also found CCE interesting and important, while more Finns perceived CCE as boring and easily forgotten. In the light of these results it is clear that CCE in Sweden seems to be more appropriate than CCE in Finland. Both nations should, nevertheless, focus more on the causes of climate change and strive to increase the students' preparedness to act.

Integrating sustainable practices for daily life into curriculum

- Wroclaw University of Environmental and Life Sciences case study

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In this study authors aim to demonstrate how sustainable practices can be implemented at curriculum, despite institutional barriers and time limits, and directly influence students' personal attitude towards sustainability. This work describes results of case study at Wroclaw University of Environmental and Life Sciences. The tutors provide additional part to Environmental Management course using methods based on Life Cycle Assessment. Initially students' views on sustainable practices in their daily life was explored. Most students self-report a concern for the environment but they give little thought to their consumption and waste and they find them either impersonal and distant. They do not understand direct connection between their everyday choices and environmental protection. They are not aware what their contribution to sustainable development matter and how their specialized environmental knowledge acquired during studies can be enforced in their daily life. The purpose of additional part of the course is to realize students that they have already acquired the necessary knowledge for turning principles of sustainability into practise in personal life. Students use Life Cycle Assessment method as a tool - the objects of assessment are products literally taken out of their handbags. Except the assessment considering the products in terms of their impact on environment, the students are also obliged to find necessary to answer the question about the influence of these products on the quality of life as well as analyze their actual usefulness. The main characteristic of additional educational materials used by the tutors is strong influence on students' perception. Evaluating survey among students after course expresses their surprise at influence of their daily choices and statement of their motivation to behavioral change. Students also emphasize the role of the tutor as an experienced guide through sustainable practices. This integrated method can be adapted to different courses and majors.

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The formation of attitudes and motivation of young people for sustainable development

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Young people play an important role in the complex of measures providing the transition to sustainable development in the Republic of Belarus. They became nearly the main participants in the modernization of economy and social sphere of the state, determine the character of society development. Today the attitudes of young people, their views, morality are having an increasingly noticeable impact on society, on political and economic processes. The necessity of organising young people on the basis of the differentiation into groups and according to their attitudes and motivation of activities is proved in the study. The following activities with young people are proposed: (1) expert survey implementation (questionnaire, computer survey), (2) activities for youth leadership development (round tables, competition of ideas, youth forums, festivals), (3) special educational courses and programs for youth, (4) the introduction of technologies of youth advisory.

Builders of Sustainable Cities

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An activity for engaging youth and adults in urban planning “Playing” [in Finnish “Pelissä yhteinen kaupunki!”] is a game-based learning method through which the players • learn to look at our living environment and understand urban planning from a variety of perspectives • explore the possibilities for a community that is both eco-efficient and can sustain well-being • acquire skills and motivation to participate positively in planning processes and discussions The method is designed for youth as well as adults and incorporates interactive game-based and collaborative learning. It is neither a board game nor a video game, for it is played in the physical world. Participants build models of urban areas, located in an imaginary Finnish city. The game facilitator provides the builders with assignments to guide them to think, discuss and learn together with others. Besides general principles of urban planning and construction, themes such as energy production, transportation, green spaces and social well-being are brought forth. Local experts in the subject areas assist the participants and assess their results. The game lasts four to five hours. Although the city and its areas are imaginary, the game operates according to real-world logic. At the same time, its fictitious nature enables free, pluralistic discussions and bold solutions. Participants end by recapping their experiences and going over what they have learned. The game situations are put into everyday contexts and compared to actual zoning processes. This ensures that participants will not come away from the activity with misapprehensions. The game provides the prerequisites for understanding the real urban-planning situations of one’s own environment. For the experience not to be isolated, it is important to create continuity: an opportunity to participate in assessing and developing one’s own environment and/or its actual zoning processes.

Understanding ethics from indigenous people for sustainable future

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Understanding ethics from indigenous people for sustainable future
The concept of sustainability and sustainable future remains a very fluid concept, with its definition varying widely among different schools of thoughts, professional or socio-economic background of the exponent or the interest group the person represents. The definition put forth by the Brundtland report is relatively wider in acceptance, despite it being inconclusive in leading to actions. It is true that concept of sustainability has to vary with interest groups since it involves a larger issue of the paradigm of development, which is dominated by western consumption based principles. From a more oriental viewpoint, defining sustainability would be much easier. Consequently, clear-cut ideas to achieve sustainability are yet to be known. However, in India, a country with varying social, value and belief systems, the numerous indigenous societies inhabiting remote locations represent a different life style that apparently is much more sustainable, especially with respect to agriculture. The present study focused in the Walayar reserve forests of the Western Ghats to understand the agrarian life of the indigenous tribes. The people in the reserve forest mainly belong to Irulas, and Paniyans. Their major livelihood activities include agriculture and collection of non-timber forest produce (NTFP). The cultivators are smallholder farmers growing crop for their use. Our custom made questionnaire survey with these individual farmers proved that, though they are having accessibility to the industrial/ mechanical large scale farming, they still stick on to the organic small scale agriculture, obviously not attracted by the consumerist economy outside their social setup.

Environmental workshops: sustainable development starts from the family

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The main goal of Environmental workshops is to give children and adults an opportunity to learn together and discuss elements of eco-friendly lifestyle, find mechanisms for its organization in their lives. Joint activity of children and adults is based on «Learning by Doing» principle. The work is organized in the premises and in open spaces: in urban parks, urban events for grown-ups and special meetings of children of different age. The approach itself is innovational for Belarus. According to it, sessions take place in an informal friendly atmosphere in the form of informational meetings, games-practicums, eco-picnics or nature walks. Participants of workshops share their experience and learn about simple steps to change lifestyle and organize life of their community according to the principles of sustainable development, put into practice the principles «Reduce Reuse Recycle». Workshops using secondary or natural materials are carried out after discussion or contemporaneously to make knowledge closer to everyday family life. Considerable attention in the program of “Environmental Workshops” is paid to communication with the environment. Families learn about such problem of modern urban society as a “lack of communication with nature” and how they can avoid it. Some elements of the Environmental Workshops program also aim to involve the family in active life of local communities: to conduct their own events and to take active part in street festivals. One of the main goals of the initiative is education and training of multipliers (older students, high school teachers, preschool teachers, environmental activists and organizers of non-formal education in the Belarusian regions) as coaches and facilitators of Environmental Workshops that in the future could hold interactive sessions with families in the regions. Children’s Environmental Workshops’ activity in the regions will form the basis for cross-sectoral collaboration, which includes state educational institutions, public organizations and commercial structures.

How to teach sustainable development in the university: Case study from Tampere

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The sustainable development is an umbrella subject shared by several disciplines in the academia. The University of Tampere has build a shared sustainable development -study module, Ecocampus-network as well as Environmental Governance and Regulation research network. All of these have been created in order to mainstream the sustainable development in teaching and research. The poster explains the current models as good practices.

Gulf of Finland - variety of learning methods for teachers

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This presentation highlights the results of the Finnish-Estonian-Russian Gulf of Finland exhibition. The project resulted in a variety of learning materials dedicated to the Gulf of Finland. These include: physical transportable exhibition in and outdoors with activating materials, voice module, activity package for teachers and also web-materials in 5 languages. The oral presentation includes experiences from Finland, Estonia and Russia about exhibition and its supporting materials as a method of teaching for different target groups. It also provides tips on how conduct transnational educational projects. If possible, the exhibition itself could be present in the conference venue in English.

Teacher's competences as essential condition for teaching in sustainable development

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World Conference on Education for Sustainable Development (ESD) in Aichi-Nagoya, Japan, marked the end of the UN Decade of ESD (2005-2014) and launched the Global Action Programme (GAP) on ESD. Estimates presented in Final Report of UN Decade of Education for Sustainable Development (2005-2014) named "Shaping the Future We Want" shown significant growth of universities joined to ESD but 9% of it only are fully included in ESD and 21 % of universities have significant progress hence universities who adopt an integrative 'whole-institution approach' are the exception rather than the rule. This report pointed that it is necessary make deeper innovation in staff development, destroy disciplinary barriers and realize whole system approach. The main goal of the Global Action Programme on ESD (GAP) is to move the ESD agenda forward. There are five priority areas in GAP: 1) Policy support, 2) Whole –institution approaches, 3) Educators, 4) Youth, and 5) Local communities. As regards the 3rd item there is need to build the capacity of educators and trainers on relevant issues related to sustainable development and appropriate teaching and learning methodologies. One of the main ideas of ESD is to study "think globally". This means the changing education paradigm – from specialized to academic education. Education for SD is based on the principles and values that underlie SD and is interdisciplinary. No one discipline can claim ESD for its own but all disciplines can contribute to ESD. Hence it is necessary to consider two types of teacher's competences – academic competences in SD and competences in separate disciplines. In accordance with their competence teachers can be a head of program and facilitator between different curricular or simple lecture.

Interactive education as introduction to sustainable development concept

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INTERACTIVE EDUCATION AS INTRODUCTION TO SUSTAINABLE DEVELOPMENT CONCEPT Despina Kitanova¹, Frosina Angelova¹, Svetlana Pejovikj¹ ¹Macedonian Ecological Society, Vladimir Nazor 10, 1000 Skopje, Republic of Macedonia kitanova@mes.org.mk, arsovska@mes.org.mk, frosina.angelova.mk@gmail.com Ecological education on nature and biodiversity is limited across Macedonia. Also, the capacities for sustainable use of forests and management of protected areas are still developing. One of the target areas for establishing a protected area and introduction of sustainable development concept is Osogovo Mt. (north-east Macedonia). This paper elaborates education on the concept of sustainable use of beech forests and understanding of the values of old-growth forests. The aim of the activity was to create an educational basis for pupils regarding the necessity of environmental reasonable behavior, understanding of the meaning of sustainable development, forest values and interactions with other living organisms. Learning platform and program was developed using the Resource Book "Education for Sustainable Development in Biosphere Reserves and other Designated Areas", published in 2013 by UNESCO and adopted to the local conditions and needs. An education forest trail was established in a beech ecosystem on Osogovo Mt. The White-Backed Woodpecker was designated as a forest guide. Training was targeted at pupils aged 10 to 12 (V grade) from two primary schools. Different stakeholders were involved in the organization and implementation of informal educational activities. The awareness for understanding and recognition of the forest ecosystem benefits was increased during the implementation of interactive educational activities. We hope that the educational activities had side effect on raising awareness among the key stakeholders managing the forest and natural resources in the region. The trail was accepted as a good model to present the concept of sustainable development in practice. Key words: Informal ecological education, beech ecosystem, educational trail, primary school, pupils.

Education for sustainable development: University perspective

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University functions for development of education for sustainable development (ESD) are especially high as far as they include not only the (study) teaching process by itself, but also responsibility to participate in the development of study materials for other study fields, input at the development of study methodology, but also the responsibility about ESD "science". A further task or solely responsibility of universities in respect to ESD process is the "training of the trainers" – preparation of new teachers aware on the need of the sustainable development process, equipped with a systemic understanding of the processes in society and natural world around and based on the knowledge of local culture and traditions. Tasks of universities in promoting ESD is clearly stated in the Aichi-Nagoya Declaration on Education for Sustainable Development": "URGE all concerned stakeholders, in particular higher education institutions and the scientific community, to engage in collaborative and transformative knowledge production, dissemination and utilization, and promotion of innovation across sectoral and disciplinary boundaries to enrich decision-making and capacity building for sustainable development, including through enhancing science-policy-practice interfaces". Considering the complexity and diversity of different issues is extremely important to identify priorities and aims of actions to achieve maximal input of the academic stakeholders to the promotion of the ESD process. As the priority actions to promote the ESD for universities might be considered the input at the development of the educational system supporting ESD – a task at which the contribution of university actors might be most efficient. A further priority task is development of study approaches and study materials to support implementation of ESD in all study programs at university level.

Teaching of sustainable development – the importance of case studies

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Current programmes of teaching geography and related specialties at pedagogical universities dedicate only limited amount of teaching hours for problems of environmental protection or discussion about principles of sustainable development, etc. It results in limited knowledge of both theoretical and technical possibilities of solving environmental problems among students, future teachers. In consequence, the low level of awareness results in social conflicts and very low level of acceptance of reasonable but poorly understood ideas. It is possible to notice that appropriate preparation of Master's thesis subjects can help in increasing the knowledge of students in this field. Determination of Ecological Footprint of two given cities or comparison of Life Cycle Assessment of two products (e.g. natural and artificial Christmas Tree) are two examples of unsophisticated subjects which are close to every day experience of students. During preparation of these Master's thesis specific problems are discussed together with general scientific background. Students are obliged to complete input data, solve the problem, discuss results and prepare conclusions. On completion of this general scheme students will acquire skills in collecting analytically and environmentally important data from government units, scientific institutions, statistical units, enterprises, etc. Interpretation of data gives students an idea about complexity of problems. Critical evaluation of final results illustrate the range of uncertainty in interpretation. Discussing the progress of work during graduate seminar gives an occasion to share the knowledge related to these problems among other students. This method indicates the importance of elaboration of interesting projects, individually or in team, in teaching of sustainable development.

Teaching of geology in secondary schools for better understanding of sustainable development

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Geological sciences cover broad scope of disciplines which results in numerous links with other fields –from biology, chemistry, physics and cosmology to technical sciences and economics. In numerous countries elements of geology are present in secondary schools during geography courses, but remain limited to data about basic rock types, geological time table, fossils, description of plate tectonics. Some other elements of geology are covered by chemistry courses – e.g. mineral names and structures. Geology is taught as dispersed fragments with no explanation of basic processes. Without discussing the methods of teaching geology it remains obvious that very important problems are omitted. Pupils are not informed about mineral resources demand and the role of geology in prospection and exploitation, importance of resources for economical developments, strategic and critical raw materials, relationships between emerging technologies and prospection for new types of raw materials, protection of deposits and lithosphere, hydrosphere and atmosphere. It is necessary to discuss what actions need to be taken in order to ensure a sustainable supply of raw materials, how to reduce the demand for primary raw materials, how to manage efficient recycling of products or production residues and how to prepare substitutes for scarce and critical raw materials. Discussing these subjects, situated mostly between classical geology, technical and economical sciences, will help students in shaping every day behavior and in making conscious decisions on local, regional and general level.

Study course „Civil protection” for the design and implementation of general and vocational education institutions at all levels of higher education

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The State Fire and Rescue Service shall implement State policy in the field of fire safety, fire-fighting, rescue and civil protection, as well as specified in the regulatory enactments regarding fire safety and civil protection requirements. SFRS will assume responsibility for the course of study drawn up in accordance with the regulatory enactments in the field of civil protection, develop practical tasks and take the required training video selection. The management system at the necessary resources, including personnel to be employed, qualifications and responsibilities. Human resources needed to implement a project – 7 people. The project team will be based on the existing employee base. All the project participants have the necessary qualifications (in accordance with Article 34 of the Law on Higher Education) and experience. The implementation of a project: 1. Project management (orders, meetings, etc.). 2. Quality and risk management. 3. Implementation of planned activities. 4. Financial management (the budget plan). 5. Progress reports and financial reports. 6. Document management. The financial resources will be used only for the purchase of different types of stationery products (paper, pens, folders, proofreaders, CD drives, etc.). The group documented the purchase price comparison, which will be annexed to the draft report.

Latvian distance learning development strategy

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For a modern society it is common to have a new point of view about education, which changes functional role of system of education and makes it an integrative social institution. The process of globalization in all spheres of public life makes implementation of the task of continuing education of the population a necessity. Education Development Program for 2014 - 2020 periods provides for "the introduction of new educational technologies and principles of the educational process to ensure effective implementation of new educational models, long - life education, including the use of modern information and communication technologies." Innovative educational technologies include distance learning. Modern distance education technologies offer real prospects for improving the quality of knowledge and efficiency of the educational process, to address various social issues related to the functioning of the education system. Development of distance education requires a special scientific investigation in two keys, interrelated problems of higher education - social accessibility and quality.

Lessons for Sustainable Development: How effective are they?

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There are many arguments for and against including sustainable development as a separate subject in schools. The experience leads us to conclude that introducing 'Lessons for Sustainable Development' as a separate school or extra-curricular subject was the best initial strategy in Ukraine. The reason was its effective outreach: it gave us an opportunity to reach out beyond the schools to the parents, families and friends of pupils, engaging them in practical sustainable actions. After several years of developing curriculum and delivering lessons to nearly 200,000 pupils in Ukraine, we set up a research program to assess the effectiveness of the lessons. The researchers have interviewed and collected questionnaires from 1,000 people: o Pupils, teachers, parents, school administrators o Who have experience of one or more years of lessons for sustainable development o With whole-school or single-class approach o And control groups with no such experience A major purpose of the research is to ascertain to what extent pupils' behaviour has been influenced by the lessons, i.e. how they have translated into action. The data are currently (December 2014) being analysed by a specialist, and a report will be prepared in early 2015. We propose using the findings to explore questions related to criteria for assessing effectiveness, to separate ESD subject versus trans-subjects (trans-disciplinary) way, and to a whole-school approach versus teaching ESD single classes.

Ninth-graders' and their geography teachers' views of climate change education

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It has been increasingly recognised that education plays a key role in addressing human-induced climate change. The ultimate goal of climate change education (CCE) is positive impacts on the climate through both individual and collective actions. Research concerning the implementation of CCE in school is scarce, but of great importance for the process of developing CCE. The aim of this study is to investigate ninth-graders' and their geography teachers' views of CCE. The respondents represent eleven secondary schools from all parts of Swedish-speaking Finland. A mixed methods research design is applied, combining data from questionnaires (549 students) and interviews (13 teachers). The results show that although the students' views of CCE are positive, they consider it does not supply them with action competence. There is considerable variation among the teachers' motives for teaching about climate change, ranging from wanting to inform the students about the topic to supplying them with action competence. Most teachers focus their content on the phenomenon itself, whereas only few focus on actions addressing climate change. Teacher-centered methods are commonly used while active learning is used to a smaller degree. In conclusion, the geography teachers in this study largely miss the ultimate goal of CCE, pointing at the need for more effort to be made in the process of developing CCE at secondary school.

Personal educational environment as a means of developing the professional qualities of the ESD teacher

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The requests of modern society for the educational results, diversity of educational systems, the right of a teacher to choose methods and means of training and, finally, the sharply increased didactic opportunities based on IT tools have set a lot of tasks to the teachers and provided them with conditions not only for the design of self-learning process, aimed at achieving modern educational outcomes and meeting the needs of its methodical and beliefs, but also the necessity of creating a personal educational environment. The aim of creating a personal educational environment of the teacher is to create conditions for the consistent implementation of creativity, self-development and self-identity, development of information culture and skills of life in the information society, the integration of sustainable development ideas into the educational practices. A principal feature of an open educational environment is the ability to create professional online communities. The key point of networking is the variety of horizontal, non-hierarchical relations. Each teacher or institution included in the network has access to all the joint resources and thereby enhances its own capabilities, allows you to save each of them their individuality and independence. Creation of an open educational environment ensures the formation of "open education infrastructure" through the social network co-design. A striking example is the networking activities of the partner network of schools in the implementation of sustainable development and ESD practices.

Baltic Sea in focus during a school year- Case Vuosaari Upper Secondary school in Finland

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The Baltic Sea emphasized all academic year at school. It was taken into account in learning practices of several school subjects, in special emphasis of some subjects, and in all school practices. Examples of the first are analysis of fiction texts of all Baltic Sea states (literature) and special exercises of the sea (maths, physics, chemistry). In biology and geography as many study issues as possible were applied to the Baltic Sea and the Baltic Sea states. A special student theatre show "Stars over the Sea" made a histrionic fight for Baltic Sea and was represented also to neighbouring schools and public. Other all school activities included specialist lectures and a special theme day in nature: orienteering of "Baltic Sea checkpoints", where the checkpoints included both informative and emotional aspects of ESD. The school collaborated the Harakka Nature Centre in Helsinki with student workshops and attending the Gulf of Finland Year conference.

Study Programme for Environmental Educators

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SYKLI Environmental School of Finland has developed the Study Programme for Environmental Educators, where students gain background knowledge, vision and above all practical methods for providing effective environmental education. The Programme equips students to complete the specialist vocational qualification in environmental protection, which has existed since the start of 2013 and is the highest vocational qualification available in Finland's education system. The scope of the Programme is 56 credits, 25 of which are in environmental education. The other studies relate to e.g. sustainable development, development project implementation, and one's operational role in the work community. Apart from the student's own work, the studies take about 1.5 years for completion. They include 15 contact teaching days, 8 of which are in environmental education. In addition to contact teaching, there is distance learning and online study as well as developmental assignments related to the student's own work. The work of the environmental educator requires, in particular, pedagogical competence and a wide-ranging knowledge of nature and environmental issues. A command of environmental education and its methods is also important. The work requires good social talents, such as interactivity and cooperation, creativity and self-direction, or grasping the work independently. The need for such skills is reflected in the content of studies and in the diversity of teaching methods used. Over the course, the student also plans and carries out environmental education events. The student's performance as an environmental educator is also assessed for the specialist vocational qualification in environmental protection by means of competence tests, which are conducted during actual work assignments. In the last two years, over 70 environmental education students have graduated with this qualification. At present nearly 150 students are working diligently towards the qualification as entrepreneurs, nature guide specialists or as experts in early childhood education, teaching, consultancy and youth work.

Many Shades of ESD

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In 2014, we closed the UN Decade of Education for Sustainable Development with a promise to continue building our common sustainable future and promote the philosophy of sustainable living and learning. More than ten years have passed in discussions on the ideas, concepts and lines of action for education for sustainable development under unspoken agreement that education for sustainable development has no borders- from values to actions, from environment to technologies- involving individuals, families, local communities, governments and even global community. Interdisciplinary and the holistic approach is the strength of ESD, at the same time it is its greatest challenge, especially in the subject based systems of learning. The UNESCO Associated School Project in Latvia has accepted this challenge by organizing seminars and different activities to build the capacity of teachers and schoolchildren to celebrate interdisciplinary, promote sustainable lifelong learning and thinking outside the box. We would like to share with the participants of the conference "Pathways to the Future Education for Sustainable Development" our vision of education for sustainable development – that is values based and culture oriented with respect to environmental, social and economic aspects – and how we promote it in Latvia by: - Organizing interdisciplinary seminars for school principals, teachers and administration (for example, on the topics of "Water, Light etc.- from environmental, physical, philosophical and cultural perspectives), - Promoting national level activities for schoolchildren on values based education for ESD, such as campaign "Draw your ABC" where more than 200 children gave a valuable advice to their peers and educated themselves about the first ABC written in Latvian language in 18th century, - Promoting sustainability and creativity in regard to the learning environment (campaign "Ideating" where schools with a help from local designers used available materials and together with a school team –consisting of schoolchildren and teachers- changed their learning environment in order to feel and study better).

Partnership Network of Sustainable Development Schools in Belarus: Ideas and Practice

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Complexity of issues related to sustainability, as we all know now, require solutions that are no longer simply local and fully depend on one particular interested party. Sustainability of every positive change depends from collaborative decision-making processes involving each affected stakeholder and require from them to work closely together to develop strategies to resolve the issue. This is why many organizations and individuals are moving towards network and multi-stakeholder governance as the way to ensure effective solutions for Sustainable Development (SD). Naturally the same applies to Education for Sustainable Development (ESD), where the effectiveness of the learning process and its outcomes depends on how well all affected stakeholders collaborate in sharing important knowledge and skills needed to best address the most pressing problems. The Earth Charter provides a very rich ethical framework for sustainable development – something each stakeholder can relate to and implement in their daily activity, but in the context of ESD, what seems to be lacking is a framework, or more specifically, mechanisms enabling effective networking for learning. We would like to present the Partnership Network of Sustainable Development Schools–Belarusian experience of creating a network of educational institutions, the first project to initiate multi-stakeholder learning process within EDS.

The Baltic University Programme at Tallinn University: 20 Years Experience Offering Courses on Teaching for Sustainable Development

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Video-presentation: The Baltic University Programme (BUP) is a network of about 225 universities and other institutes of higher learning throughout the Baltic Sea region. The network is coordinated by the Baltic University Programme Secretariat at Uppsala University, Sweden. The Programme focuses on questions of sustainable development, environmental protection, and democracy in the Baltic Sea region. The aim is to support the key role that universities play in a democratic, peaceful and sustainable development. Tallinn University is the part of the Network from 1993, we are teaching the BUP courses A Sustainable Baltic Region, The Baltic Sea Environment and Education for Change. The video-presentation is composed from the photos showing activities of the Tallinn University students during these courses, and summary of the activities and methods used during the training.

Impact of an alternative accounting model utilization on entrepreneurship students' learning experiences

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Aim(s): The aim of this study is to explore the learning experiences that the entrepreneurship students have with different accounting models (simplified representations of the actual processes) in a virtual university. The study analyses the impact that templates of different accounting models have on undergraduate students' knowledge acquisition and learning experiences in real world settings. Knowledge acquisition through practice enable to study the needs of entrepreneurship students. Recent authors, for example Boulianne (2014), Mostyn (2012), Phillips & Heiser (2011), Phillips & Johnson (2011), Burstein & McCarron (2010), do not question the accounting cycle in learning process. The accounting cycle has been, for hundreds of years, the accounting model of the manual accounting process for accounting specialists. According to constructivist research paradigm people perceive the world differently, therefore reality is socially constructed and subjective. Consequently different models of entrepreneurial and accounting processes exist and will change over time. Incorporation of information and communication technologies (ICT) has changed learning process management and business activities itself. The problem of entrepreneurship students is to understand accounting data processing. Entrepreneurs need to understand the relationship between business activities -> data processing -> financial reporting that affect their decisions and further business activities. **Method(s):** External model validation: an experiment and an online survey methods were employed to collect primary data about students' knowledge acquisition and engaging learning experiences. The study took place in march-april 2014 at UOC (Universitat Oberta de Catalunya) that is a virtual university. Participants were 219 undergraduate students enrolled for the first financial accounting course. **Result(s):** Respondents' learning experiences indicate that the spreadsheet template of the alternative accounting model facilitates procedural knowledge acquisition in real world settings and impact entrepreneurship student's satisfaction and understanding of the effect of business activities on financial statements.

Pure water theme park

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Pure Water Theme Park (PWTP) focuses on the topic of clean water, it is the place where you can get answers to numerous questions: how does clean water spring up+ how does life depend on clean water? What does the quality of water change from? The Theme Park with its centre is situated in Pandivere Upland, in Pandivere and Adavere nitrit-sensitive area in Metsamõisa farm. This Theme Park bears the ideas of Tõnu Ots, a famous Estonian psychologist, "The Creator has hidden the knowledge of the world in the nature – it is our duty to find it." The services we offer to people aim at introducing, using and caring about things happening in the surrounding nature.

An Interdisciplinary Project of Springs at Viljandi

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An Interdisciplinary Project of Springs at Viljandi Springwater is an important component of water cycle and a source of pure water in waterbodies. Springs need more attention as a part of ecosystem, healthy lifestyle, history and culture. Systematical studies give us information about this national resource so that springs could be better known and preserved. In 2012 Viljandi Hobby School started a project „Springs“ and found partners – Viljandi Gymnasium, Kalmetu School, Viljandi and Tarvastu Music and Art Schools, Tartu University and others. The goal of the project was to get data about the springs at Viljandi and inform the community about the values of natural springs. The students of Viljandi Gymnasium made several field trips and mapped the outflow spots of springs. The descriptions of ecosystems were compiled of the collected data, bio-chemical composition of water was studied in laboratories. The properties of different soil layers came out. The diversity of plants was listed and herbariums made. It was found, that spring wells could be built at the sporting track at the Lake Viljandi. A website viljandiallikad.wordpress.com was developed, on which descriptions of springs have been published with results of analyzes, associated map, an overview of the events and a gallery. Two concerts inspired by water took place. Students gathered ethnographical stories and made poems about springs. An excursion to some famous spring areas in Estonia was organized. A student of TU College made a constructional project to improve the surroundings of a spring, to build a well and a resting house. An exhibition of posters was designed to introduce the importance of springs to public. The project „Springs“ turned out to be a good interdisciplinary method to make easily understandable how nature resources, health, history and art is connected in one object – pure springwater.

Environmental Education At Tartu Kivilinna School

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Tartu Kivilinna School supports environmental education as well as sustainable development. All teachers at Kivilinna School use project learning in many different ways. The science teacher Helis Hani and the class teacher Piret Jõul have organised and carried out nature camps and environmental learning days with the support of KIK / EIC (Keskkonnainvesteeringute Keskus / Environmental Investments Centre). The aim of these activities is to encourage students to save our environment. Every autumn the teachers of science organise an environmental learning week, which is related to the yearly environmental subject (e.g. The Water, The Forest). At the end of each term a project week is held, using methods of active learning. The teachers at Kivilinna School write projects to support the curriculum. The aim of these projects is to embed the knowledge learned in lessons through practical tasks. The students at Tartu Kivilinna School acquire knowledge through explorative discovery learning lessons. The students learn by formulating hypotheses, experimenting and making conclusions. Helis Hani and Piret Jõul organise a competition called "Loodus lummas" ("Nature Is Fascinating"). During this competition the second year pupils of Tartu show their knowledge of nature by participating in practical workshops.

UNESCO ASPnet school network in Estonia – fostering education for sustainable development in school ethos and practice

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Founded in 1953, the UNESCO Associated Schools Project Network (ASPnet) is a global network of 9900 educational institutions in 181 countries. In Estonia, there are currently 21 different schools in the network: big and small, both from cities and from countryside and with different languages of teaching. The aim of the network is to promote the main ideas of UNESCO: peace and intercultural understanding, human rights and democracy, sustainable development and quality education through national and international projects. In 2013, the network had its 60th anniversary and redefined some of its priorities. Sustainable development and global citizenship education became the main ideas on which the activities of the network should be based. In Estonia, the network schools went through an evaluation in 2014 and jointly agreed a new set of criteria for being a UNESCO ASPnet school. These include making the priorities visible in school vision and mission, in curriculum, in teaching- and learning, the whole school environment and leadership as well as in cooperation with other interest groups. To do this the schools get support and training, opportunities to share experiences and best practices among themselves as well as opportunities to be involved in joint activities such as UN Simulation and Pupils Research Conference. This session discusses how does the Estonian ASPnet support ESD and what could be seen as the challenges and achievements of the network so far.

Biodiversity study in city environment

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Ecological balances in different city environments and why? Biological diversity teaching content and methods in city environment. City as a habitat for different species, problems and advantages in biodiversity. Practical workshops in studying, observing and planning biodiversity in city environment.

Sustainable development and environmental awareness at the Estonian University of Life Sciences

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Estonian University of Life Sciences (EULS) was the first university in Estonia to take the initiative to become a green university in its everyday activities and to integrate the principles of sustainable development (SD) into the teaching process and study outcomes. In order to evaluate the activities to reach the expected target that students understand the connection between their speciality and SD and are able to integrate the respective principles into their work, some indicators were developed first. One way to measure the aim of being recognised as a provider of university education in SD is to estimate the number of bachelor, master and PhD thesis's defended in the areas of SD. A pilot study was carried out in 2013 in two specialities: management of urban and industrial landscapes and landscape protection and management. In total, 43 bachelor and master theses were evaluated and 31 theses (72%) were associated with SD, most of them in area of protection of biodiversity, semi-natural communities and landscapes. In order to evaluate how a curriculum has influenced our graduates' environmental awareness, a questionnaire was carried out in 2014. 55% of respondents said that studying in EULS helped to increase their environmental awareness, 18% said already known principles were reviewed, 19% said their studies were only somewhat connected to environmental awareness and 7% said their time in the university did not increase their environmental awareness. Until now we have focused on the mapping of current situation. The next challenge is to determine the most effective methods to interdisciplinary implement the principles of SD to every curriculum, not only environmental specialities.

The Baltic Sea Project of UNESCO

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The Baltic Sea Project (BSP) is an international network among schools for a better environment in the Baltic catchment area. The countries bordering on the Baltic share many environmental problems, starting with the pollution of the Baltic Sea. In attempting to solve the environmental problems, education is one of the key factors. BSP has therefore initiated cooperation among schools in all the countries around the Baltic. Today, over 200 schools are active in the BSP. Objectives: To increase the awareness of the students about the environmental problems in the Baltic Sea area and to give them an understanding of the scientific, social and cultural aspects of the interdependence between man and nature. To develop the ability of the students to study changes in the environment. To encourage students to participate in developing a sustainable future. Practical measures: To set up a network of schools and other educational institutions. To create and develop educational approaches and joint programmes for environmental and international education. To organize joint activities and events. To publish the BSP newsletter and other relevant information. Educational approach: To achieve a balance between a holistic view and individual subject studies. To change the role of the student from passive recipient to active constructor. To change the role of the teacher from supervisor to guide in a learning process. To use networks to provide participants with opportunities to learn and pass along new ideas. To use international cooperation as an inherent element of school work. International contacts: Schools in different countries have contacts through correspondence, exchanging exhibits and videos, by visits to the schools and using Skype or other cloud-programs to communicate and discuss ideas. During these visits the students usually study a local environmental, social or economic problem together and try to find more sustainable solutions.

MAPPA-support materials and practical tips for ESD

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MAPPA is an internet search service, in which materials and practical tips for ESD (education for sustainable development) can be easily found. The service offers tools and support for schools, early childhood education, nature and the environmental school teachers as well as other environmental educators, planning lessons and programs. Materials, which have been produced by various organizations from the field of ESD, have been collected in one database. The database contains already almost 900 different materials and the amount increases all the time. All producers of ESD material are free to add their own material to MAPPA. Material itself is not stored to the database, only the metadata (data about the containers of data) is saved. MAPPA helps to bring good and high-quality materials more visible and more widely available. The aim is that in the future MAPPA will be the main ESD material distribution channel in Finland. MAPPA originated in the project, which involved various different associations and even public administration. The project is funded by the Ministry of the Environment and is managed by The Finnish Association of Nature and Environment Schools. Visit our website: www.mappa.fi

Urban gardening as a students' SD learning experience

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Education of Sustainable Development is an important aspect of higher education since it might influence the attitude and behaviour of the students. However, many courses face the problem of classes being more theoretical than empirical. Many students, especially in Poland, argue that SD courses do not provide opportunities for real life experience. That is why, it is viable to encourage students and motivate teachers for exploring possibilities of ES implementation in their closest surrounding. One solution may be to stimulate students to set up their own ES projects. The aim of the poster is to present urban gardening as an initiative that promote sustainable development among students. Urban gardening is a practical experience of understanding the role of specific climatic conditions and its influence on food production. It is also one of the solutions that encourage students to take responsibility of the food and, therefore, to understand where the food comes from and how much effort has to be put in food production. The poster includes successful example of the university campus farming in Helsinki, Finland. This is an important and educational initiative that is organised and managed by students for students. On the basis of that, the swot analysis of an implementation of a similar solution is done for Polish universities.

Ecovan - Outdoor Classroom

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This innovative and sustainable van is aimed to enhance educators to use their local environment for educational purposes. The concept of the Ecovan is aimed to be an answer for Richard Louv's and many others' concern of children (and adults) suffering from the phenomenon of nature deficit disorder. Children and adults are increasingly spending their time sitting indoors and therefore outdoor exercises made with the Ecovan are intended to improve people's relationship to their local natural environment. The van carries technical devices (e.g. digital microscopes, tablets, and a big screen) as well as traditional environmental education material (e.g. binoculars and snowshoes). All the gadgets that are used in the van are researched to be as sustainable as possible and that is why the electronic devices in the van are run by the energy produced by solar panels attached to the roof of the van. Also, the equipment's that are used for researching for example water environments can be dried in a drying cabinet on the road. The van is a mobile tool to be used with many organisations regardless of the location. Ecovan is intended to build bridges from school curriculum, including biology, chemistry, mathematics, and many others into one's everyday life. The structure, ideology, and the movability of the Ecovan allow flexible use of the car. For example in a city of Lahti, it is used both for environmental education in schools and sustainable development for citizens. The model, drawings from the structure of the boat, and the idea of the ecovan can be copied into other projects. All the information with pictures can be found at www.ekopaku.fi or contact straight project manager aulikki.laine@luontokoulut.fi

The role of the set of educational materials for teaching mathematics in primary school in the application of the ideas of sustainable development

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The application of the ideas of sustainable development in the educational process of the contemporary school is a global civilizational project. Studying mathematics can contribute to reaching its key goals: fostering the thirst for knowledge, developing intellectual skills, mastering the new knowledge tailored for individual capacities of the child and so on. The goal of this presentation is to overview the potential for the set of educational materials for teaching mathematics in 1-4 grades in Belarusian schools to apply the implications of the sustainable development. The set of educational materials consists of a textbook, tutor's manual, writing book, test book, writing book for challenging tasks and digital educational facility. The key idea of the new set of educational materials is using educational modeling as an instrument of representation of mathematical concepts. Educational models are presented by images (visual educational models), words (verbal educational models), mathematical symbols (symbolic educational models). The didactic effectiveness of addressing educational modeling for visualizing mathematical concepts is provided by: a) methodical support of primary mathematical education presented by static and dynamic models, b) the set of educational tasks aimed to train pupils to create models without assistance, c) the system of primary mathematical education, which articulates the models of different types (visual, verbal, symbolic) when considering one concept. This presentation shows that primary schools teaching practice based on educational modelling contributes to two main directions of sustainable development: on one hand, it helps to individualize the process of education, to adjust it to the capacities of 6-10 years old, and on another – helps to cultivate educational independence through the skills of building the models of new concepts. In the context of sustainable development, the experience of modelling is a valuable skill opening for the child the possibilities of independent cognition and continuing the education for life.

University green team - Students as making universities more sustainable

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The green team movement started by the university of Maastricht has been implemented at the university of Helsinki during years 2013-2014. We have recruited a student team which has been an innovative group creating sustainability actions at the university. Students have had constant support from the staff members, but have been working independently creating e.g. environmental public events, discussions, improving bicycle routes and facilities, starting campus gardening. The green team advances sustainability thinking by involving students and staff and by creating pressure to change also within the university managers. In our presentation we will demonstrate work and achievements of two student green teams of the University of Helsinki and elucidate on future development goals for student driven - staff supported sustainability work conducted at universities.

Co-Learning, an Approach for Youth Participation in Sustainable Development

Ekolibria: Beyond the Books
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The GAP is an action-oriented programme aimed for the post-2015 global ESD agenda. In order to enable strategic focus and stakeholder commitment, the Global Action Programme focuses on five priority action areas which are key leverage points to advance the ESD agenda. 1. Advancing policy: Mainstream ESD into education and sustainable development policies to create an enabling environment for ESD and bring about systemic change. 2. Transforming learning and training environments: Integrate sustainability principles in education and training settings. 3. Building capacities of educators and trainers: Increase the capacities of educators and trainers for effective delivery of ESD. 4. Empowering and mobilizing youth: Generate ESD actions among youth. 5. Accelerating sustainable solutions at the local level: Scale up community-based ESD programmes and local multi-stakeholder ESD networks. Ekolibria's vision With Ekolibria's mission in mind, a focus on priority action areas 3 and 4 would offer great opportunities and hold strong promises for the dissemination of both the knowledge concerning SD issues and the required skills that will enable the young generation's ability to actively take part in the future transformation of society. Educators and trainers are powerful agents of change in the realignment of the education sector to address sustainability and enhance the role of education and learning in sustainable development projects and initiatives. Central to this envisioning and shaping of a more sustainable future is youth participation– the generation that must cope not only with today's consequences of unsustainable development, but also its future costs. Currently half of the world's population is under 25, which poses a great opportunity if they can be mobilized in the direction of seeking sustainable solutions. As witnessed during the Arab Spring, youth in many emerging countries are clamouring for a bigger voice in how their societies are being configured. Youth also constitute an important group within consumer societies, the habits they develop now will play a decisive role in future consumption patterns. The purpose of this oral presentation is to propose a peer to peer co-learning method for ESD to foster increased youth involvement in the process of moving toward a more sustainable future.

Learning by inquiry is relevant for education for sustainable development

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Our future world needs creative citizens who are scientifically literate and able to put their knowledge into practice, solve the complex issues like climate change and food security. But sustainability is at risk because young people are not interested in science and teachers feel unsecure about teaching ESD because of the complexity of the global issues and lack of teaching materials, funding and due to other issues. And, even if the students have a good knowledge about science and environmental issues, there lacks the ability to put knowledge and facts into practice, i.e the component of learning for environment and for sustainability.

The aim of environmental education (EE) and education for sustainable development (ESD) is to equip future citizens with the necessary awareness, knowledge, attitudes and skills for a more sustainable development (SD) and an proactive approach to apply these in their everyday life.

It has been shown that inquiry-based learning (IBSE) can increase both – students' interest in science related subjects and also teacher motivation, but it is not yet very common practice in education for sustainable development.

IBSE is a learning method that starts by posing questions, not by giving final facts. During the inquiry process, the learners read scientific publications, pose research questions, conduct investigations or experiments, analyze the results, make conclusions and discuss the results with others.

Sustainability issues do not have a clear answer, i.e are open-ended questions that are difficult to tackle but by doing inquiry, students acquire the awareness, knowledge, attitudes and skills necessary for SD.

This presentation is a theoretical analysis of the compatibility of ESD and IBSE. Inquiry learning is relevant for education for sustainable development.

Science from daily life, i.e. Live Science

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What does a schoolchild know about science or the everyday life of a scientist? Probably not too much. If this is so, then the student might not understand the connections between science and daily life and might miss out on an exciting profession and a career opportunity when planning his/her future. A group of active Doctoral candidates from the Estonian University of Life Sciences started tackling this issue to broaden the minds of the youth by talking about science interestingly and in the "human language". Their project was titled "Live science". The project launched in spring 2011 aimed to introduce the university's fields of activity, emphasising the importance of nature, rural life and the related fields. Educating the minds of the young, training volunteers and speaking of one's field of science in a simple language was considered equally important. The organisation of practical workshops for students became the primary activity for "Live science". It is possible to integrate the available workshops into a subject lesson regardless of the students' age and the school subject, as the fields and scientific topics introduced are interdisciplinary by nature. The workshops have so far been carried out by volunteer university students who wish to spread science outside the university walls and talk about "their thing" in a simple language, but also to break myths and look for exciting challenges by offering students an opportunity to experience hands-on science. The initiative of the Doctoral candidates has by now grown into an exciting network with more than 7000 scientifically curious students and over 100 participating schools. The project has also been acknowledged for popularising science and offering environment-friendly education. And so the growth and discovery continues: Teaduslahing ("Science battle") launched in January 2015 takes science to the basic school classes, testing the students' knowledge of natural and exact sciences, their creativity and teamwork skills. It is planned to reach all the counties with the scientific contest within a week and to engage around 200 three-membered teams across Estonia.

Love, hope and biodiversity. Are terrified stories necessary in education?

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UN Convention on biodiversity, one of the main pillars of sustainable development, pays the great attention to education but Art. 13 of CBD devoted to education does not give the detailed prescription how the education should be provided. Very often it is based only on data showing very terrifying rate of biodiversity loss. But "biodiversity" it is a general term without "face". To protect something with passion we need positive emotions, and it is difficult without personification, without face of individual species. The role of love and hope in education for biodiversity is expressed by IUCN Commission of Education and Communication in slogan "love not threat". Such attitudes are also represented in education based on philosophy of San Francis de Assisi and on poems of Polish poet Jan Twardowski. Several examples of educational materials based on Franciscan philosophy and Jan Twardowski poetry to create positive emotions towards biodiversity will be presented as examples of good practice.

ESD in Higher Education: University students' perceptions of sustainability and its relation to their self-efficacy beliefs to integrate sustainability into their profession and daily lives

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The idea of integrating sustainable development (SD) into higher education emerged with the Stockholm Declaration in 1972 addressed the importance of incorporating Education for Sustainable Development (ESD) into universities' curricula since they have crucial role for sustainable future by means of capability to educate future leaders to engage science, economy and community. Since then, ESD become central issue in higher education as increasing awareness about effects of daily activities on environment, economy and society. As McKeown denoted in order to proceed in incorporating SD into education system, contributions of disciplines are significant. Hence, increasing university students' level of motivation is essential since motivation affects individuals' act and attainment of goals. As learning and attainment are reciprocated to motivation, the content of ESD courses should be formed concerning these relationships. Therefore, the quality of ESD programs becomes crucial since it may affect future leaders' self-efficacy to incorporate sustainability context in their profession and daily life. Accordingly, this study aims to explore if there is a relationship between university students' understandings of sustainability and level of self-efficacy beliefs on integrating sustainability into their profession and daily life. 113 students participated from different undergraduate programs of public university in Ankara/Turkey. Self-efficacy beliefs instrument is used which previously developed by Enochs & Riggs (1990) and adopted by the researchers. University students' understanding of sustainability was explored qualitatively via content analysis of answering following question, what is your definition of sustainability. A mixed method-explanatory design is used to analyse data. Students responses to scale was analysed via descriptive statistics and results of content analysis will be interpreted to examine mental models on SD. The relationship, if any, may explain how self-efficacy may affect individuals' embracing the notion of SD in daily life and profession.

Movies, as a driver of change in perspectives: an evaluation of the impact of environmental documentaries on students in adolescence

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It is known that the audio visual aids have discernible impact on people of any life stage, child, adolescence, youth or adults. However, the impact is likely to be higher at younger stage of development, especially during adolescence when a worldview is being developed in them in response to various stimuli from their social life. The impact of an audio-visual experience could have higher weight than other media since it attracts multi-dimensional attention and almost all the senses of a person. In the present study, we exposed student, undertaking Bachelor degree program in technology, in the age group of 19-20 years to a series of documentary films projecting various real-life issues. The students belong to different social segments and socio-cultural and educational backgrounds. The present exercise was an attempt to understand the level of influence of the documentaries on the student's perspective. The study shows wide impact on the students, which to a great extent depends on their background. It was seen that audio-visual media especially documentary films would help modify the overall perspective of the viewers. Transferring environmental education practices to South Caucasus and Central Asian countries Margit Säre Estonian NGO - Peipsi Center for Transboundary Cooperation (CTC) Margit Säre margit@ctc.ee The paper introduces Estonian environmental education, outdoor learning practices, transferrable to South Caucasus and Central Asian countries. Estonian NGO— Peipsi Center for Transboundary Cooperation (CTC) has been implemented several development cooperation projects in Moldova, Georgia, Armenia, Tajikistan.

Our experience shows that NGOs in those countries have main moving force in development of environmental education, however recent years environmental education is gradually expanding and becoming a constituent part of the education system. For example in our project "Development of Armenian environmental education – for improved biodiversity" (2014), methodological modules for outdoor study program were worked, which were also approved by the Ministry of Education and recommended for use by other teachers in Armenia. Our experience shows that in formal education system, the main problems are connected with lack of financial means (lack of equipment, study materials, possibilities to travel outdoors), lack of special teacher trainings, and in several cases we have also witnessed alienation from nature (teachers, students have several fears being in nature). On the other hand, we have also witnessed great enthusiasm by several teachers to introduce environmental issues to the curricula, despite of limited resources. Through our projects we have trained NGOs, school teachers, organized study trips, supported purchase of equipment, development of training materials. Very popular have been introducing games, crosswords, puzzles, which are easy to include to the curricula and do not cost almost anything. More about our projects: www.ctc.ee

Transferring environmental education practices to South Caucasus and Central Asian countries

Margit Säre; program manger in NGO Peipsi Center for Transboundary Cooperation (CTC)

The paper introduces Estonian environmental education, outdoor learning practices, transferrable to South Caucasus and Central Asian countries. Estonian NGO– Peipsi Center for Transboundary Cooperation (CTC) has been implemented several development cooperation projects in Moldova, Georgia, Armenia, Tajikistan. Our experience shows that NGOs in those countries have main moving force in development of environmental education, however recent years environmental education is gradually expanding and becoming a constituent part of the education system. For example in our project "Development of Armenian environmental education – for improved biodiversity" (2014), methodological modules for outdoor study program were worked, which were also approved by the Ministry of Education and recommended for use by other teachers in Armenia. Our experience shows that in formal education system, the main problems are connected with lack of financial means (lack of equipment, study materials, possibilities to travel outdoors), lack of special teacher trainings; and in several cases we have also witnessed alienation from nature (teachers, students have several fairs being in nature). On the other hand, we have also witnessed grate enthusiasm by several teachers to introduce environmental issues to the curricula, despite of limited resources. Through our projects we have trained NGOs, school teachers, organized study trips, supported purchase of equipment, development of training materials. Very popular have been introducing games, crosswords, puzzles; which are easy to include to the curricula and do not cost almost anything. More about our projects: www.ctc.ee

Overview of the network of non-formal environmental education in Estonia

Estonia has a fairly dense network of natural and environmental education centres: it joins more than one hundred establishments offering non-formal education and opportunities for self-development. The network has only become denser with years, but there is still much to do. The directions of environmental education in Estonia have been set in the concept for environmental education (http://www.envir.ee/sites/default/files/elfinder/article_files/kkh-kontseptsioon.eng_.pdf), which states that environmental education is a compulsory part in all levels of education and is valued by the society; every person regardless of their age should have the opportunity to gain knowledge on sustainable living. Quite a lot has been done in Estonia to achieve that as the network of natural and environmental education centres and organisations has thrived during the past decade. This has been promoted by state policies. For example, environmental issues as an important aspect of life have been included in the national curricula for basic and upper secondary schools as a cross-curricular topic; it is also possible to apply for funding for activities related to environmental education from the Environmental Investment Centre. The increasing use of outdoor learning has also contributed to the development of environmental education. More than one hundred centres offering versatile activity within the fields of natural and environmental education have been established to date. These centres differ in terms of the opportunities they offer: some have an exposition and a classroom with learning aids, others organise educational programmes and outings in nature or visit schools or nursery schools to organise activities there. These establishments are called differently, mainly according to the scope of their services: so we have support points, nature schools, theme centres (e.g. the Ice Age Centre) and museums, nature schools, environmental education centres and even some enterprises. The scope of topics covered is wide: teaching species, introducing natural communities, teaching camping skills or for the field of mineral resources and energetics, for example. A more precise overview of the activity of these one hundred or so centres is available at <http://www.keskkonnaharidus.ee/index.php?lang=en>. The establishment of nature

houses in Estonia during the 1950s in Tallinn, Tartu and Pärnu may be considered the beginning of natural education in Estonia. Their principal activity until the 1990s was related to non-formal education. The nature houses are still active in Pärnu and Tartu. Life has been more complicated in Tallinn: the nature house was closed there in 2001. A few nature clubs were also active in the Nõmme youth house from the mid-1970s. The related non-formal education centred in Nõmme in 2001. Hobby clubs were set up also in the Tallinn Zoological Gardens and a few years ago in the Estonian Museum of Natural History. The development of environmental education in Estonia has gained much momentum with the support of the EU Structural Funds. The previous financial period from 2007–2013 included two measures: development of the infrastructure of environmental education supported by the European Regional Development Fund with (ERF) with 22.3 million Euros and the measure for developing environmental education which received 3.2 million Euros from the European Social Fund (ESF). The new, current period does not foresee a direct measure for developing environmental education. Therefore we need to use the resources created within the past few years wisely. If schools and nursery schools wish to participate in such programmes of the centres that are related to their curricula, then it is possible to apply for funding from the Environmental Investment Centre. This provides the opportunity to take the students out of their school environment, but requires skilful planning from the schools as well as the centres. Several counties have started bigger joint projects to simplify this procedure so that all students of a given county could participate in the programmes offered by the centres once per year. This idea was initiated by the county round table discussions on environmental education that are coordinated by the Environmental Board from 2010. Maris Kivistik, Director of the Department of Environmental Education of the Environmental Board

