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## *Editorial*

Journal of Teacher Education for Sustainability (JTEFS) welcomes the authors, Editorial Board, and our international audience on the publication of eleventh issue of JTEFS. I would like to acknowledge the valuable contribution of the members of Editorial Board and, especially, the language editors for their knowledge, prompt and devoted work, and incessant interest in the theme of teacher education and sustainability.

The first issue of the 11<sup>th</sup> volume of JTEFS comprises the contributions from USA, Latvia, Lithuania, and Finland. This issue contains eight articles and represents the large variety of topics and research methodology starting from the wide theoretical elaborations to the specific case studies and quantitative research.

The presented issue of JTEFS starts with the proposal and elaboration of the new concept in education for sustainable development (ESD) – the ecology of education based on knowledge systems for sustainable development. The authors first explain why teachers need to know this and then describe how teachers of education for sustainability can implement and assess this approach in the classroom. The authors of next article analyze the implementation of aims and tasks of the UN Decade of ESD in Latvian higher education institutions. They describe the results obtained from the research on five ESD indicators by considering the situation in four higher education institutions in Latvia. The authors of the first article from Finland suggest that higher education institutions should be proactive leaders in promoting societal change for sustainable development. The article describes how researchers and teachers of ESD from universities in the Baltic Sea Region participated in the development of a model on learning for sustainable development, and than details on contextual, mental and activity related aspects of this model. Further, the researchers from Lithuania reflect on the results from teachers' interview about the role of the teacher in cooperation with the community, their partnership with parents to foster social inclusion, and educational involvement of children from different backgrounds.

The next two articles of this issue illustrate the results of the projects related to the role of teacher in providing the sustainable future. The first one reflects on the experience of Multilingual Education Pilot Project (2006 – 2008) implemented in Georgia, tracks observable changes in the education environment, and analyzes the pedagogical factors involved in successful implementation of multilingual education and sustainability of the innovations. The second paper highlights the study that is a part of EU COMENIUS project. It explores the situation in Latvia with energy topic in non-formal education in the context of ESD. The next article authored by Finnish researcher focuses on what student teachers from the University of Helsinki think of the future in preschool and primary school of the year 2030. The current issue of journal concludes with an article describing the model of creative process aimed at facilitation of prospective secondary education art teachers' creative activity.

Since the agreement with VERSITA about the electronic coverage of JTEFS using METAPRESS technology has been signed in 2009, the full information and published issues of *Journal of Teacher Education for Sustainability* further will be available on VERSITA homepage <http://versita.com/science/education/jtes/>. The terms for article submission are December 15 for the spring volume and June 15 for the autumn volume of JTEFS.

Editor-in-chief: **Anita Pipere**

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## THE ECOLOGY OF EDUCATION: KNOWLEDGE SYSTEMS FOR SUSTAINABLE DEVELOPMENT AND SUSTAINABILITY

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### **Abstract**

*Research in knowledge systems for sustainable development (KSSD) seeks to determine how science and technology can be put into effective action at a local level. Teachers in education for sustainability attempt to achieve the same goal. KSSD research has indicated that success is context driven, that panaceas are inappropriate and that knowledge systems at best provide solutions in evolution. In this paper, we describe a teaching framework that we are developing to support KSSD researchers and teachers in education for sustainability based in ecology of education. While a need for ecology in education may be apparent, there is concurrently an equally important need for ecology of education. We argue that one cannot teach ecology in education adequately without an appropriate ecology of education. This paper first explains why teachers need to know this and then describes how teachers of education for sustainability can implement and assess this approach in the classroom.*

*Key words:* ecology; education; sustainability; systems; teaching.

### **Introduction**

Teaching sustainability is not easy. The definition of what sustainable development and sustainability is and how to best achieve it through education is still uncertain. Teachers are not sure what to teach, nor are they sure of how to teach it (Jickling, 2000; Johnson & Mappin, 2005; Wals & Jickling, 2001). For students the issues surrounding global sustainability and possible global futures are very emotive and value-laden, such that most prefer a collaborative approach over a traditional teaching methodology (Hicks & Bord, 2001; Ono, 2005). Overall, the current efficacy and validity of environmental education around the globe is poor. Current environmental education continues to take a human-centered approach and makes little to no linkage between humans and nature (Bonnett, 2007) even though human-nature linkages need to be addressed (Clark, 2007; Kates & Parris, 2003). Furthermore, environmental education does not adequately

address the necessary improvement in global human-human relationships (Barraza, Duque-Aristizabal, & Rebolledo, 2003) equally essential to a sustainable future (Kates & Parris, 2003).

In this paper we describe what is a potentially more valid and effective approach to education for sustainable development (ESD) and sustainability. It is a more natural approach, one reminiscent of our earliest human lineage of community living and collaborative learning, yet it employs some of the newest principles from the complexity sciences. It is an approach that moves education for sustainability away from the exclusive realm and responsibility of environmental education toward a multidisciplinary methodology that involves a concerted effort from, and shared responsibility by many teachers as some have advocated (Johnson & Mappin, 2005). In this paper we expand on an alternative somewhat contemporarily underutilized vision of teaching and learning, the nascent aspects of which have been developed by a number of education research scholars such as Paul F.-Brandwein (see Bennett & Bennett, 2004), Stephen Sterling (cf. 2003), Carlos A. Torre (1995a, b, 1996, 2003, 2005a, b, c, d, e, 2006, 2007, 2008, 2009; Torre & Joyce, 2007; VanderVen & Torre, 1999; VanderVen, Torre, & Maholmes, 2002) and, most recently, by André F. Pilon (2009) that may help to solve some of the difficulties with teaching and learning sustainable development and sustainability.

For example, Brandwein viewed school–family–community, postsecondary systems, and culture as distinct ecosystems that can reinforce each other and help to teach both knowledge and values not only regarding the environment but also with respect to the communities within which we live. Drawing on over thirty years of environmental education and teaching research scholarship, in his 1995 book *Science Talent in the Young Expressed within Ecologies of Achievement*, published posthumously, Brandwein wrote,

*The ecology of education comprises three inter effective ecosystems – that of the family–school–community, the culture, and the postsecondary systems. When these three ecosystems interact harmoniously, they form an ecology of achievement that offers all the young opportunity for their special endowments... to flourish” (Brandwein, 1995, p. xi, after Bennet & Bennett, 2004).*

In this tradition, as described in this paper, we seek to expand this view into a broader more global ecology of education, one that links the local to the global in action toward a sustainable future.

The UN’s Brundtland Report provides the standard but somewhat general definition of sustainable development as, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN, 1987). More recently, Hegarty (2008) has provided a definition of sustainability that seeks to more accurately reflect the multidimensional nature of the issue:

*Sustainability relates to the continuity of economic, social, institutional and environmental aspects of human society, as well as the non-human environment. Sustainability means that as a society we are aware of the impact of our actions on others and on the planet, that we take responsibility for these actions and are transparent in our processes (p. 682).*

However, both sustainable development and sustainability remain conceptually elusive, as illustrated by how the term has been variously utilized in a variety of disciplines in varying contexts that range from forestry management to sustaining maximum yields in fisheries to envisioning steady state economies in sustainable societies (Brown, Hanson, Liverman, & Merideth, 1987; Jahnke & Nutzinger, 2003). Stemming from the ambiguity regarding generally applicable operational definitions, it has, perhaps not surprisingly been difficult to develop and implement valid and effective curricula for sustainable development and sustainability in schools (Johnson & Mappin, 2005).

Despite these difficulties, sustainable development and sustainability is something we must collectively achieve on a global scale if we wish to perpetuate the human species here on earth. Given the limited progress made so far, there appears to be a growing call for a new, more effective kind of ESD and sustainability at all levels; from schools (K-12) and universities, to the education of corporate culture, to the education of political governance (Auld, Bernstein, & Cashore, 2008; Barraza, Duque-Aristizabal, & Rebolledo, 2003; Bonnett, 2007; Federico, Cloud, Byrne, & Wheeler, 2003; UNESCO, 2005; WWF, 2006).

We argue that if we are to achieve a transition toward sustainable development and sustainability as a global society, teachers and school boards must collectively and collaboratively adopt a broader scope of education and action, one beyond environmental advocacy and one that is both informational (educational in the traditional sense) and transformational (changing behaviors and attitudes). That is, education must not only address all the knowledge dimensions of sustainability such as environmental change, poverty, and human rights, perhaps even more importantly, it must also help students to actively engage in the various behaviors and attitudes related to the improvement of these dimensions of sustainability. To accomplish this broader, imminently important objective the very method of education must change. As we detail further, a new methodology, one based in ecology of education must be developed through collaborative research. We argue that an ecology of education methodology is likely the best suited to transfer information to students in such a way as to not only impart knowledge but also generate the more esoteric attributes of wisdom, value inquiry and critical thinking engaged in community action. These are some of the very attributes which the UN has called for as teaching/learning objectives in its Decade of Education for Sustainable Development (UNESCO, 2005).

Perhaps somewhat inadvertently, the real world implementation of the foundational elements for this type of transformative education, one that is based in but expands on the ecology of education perspectives of Brandwein, Torre, Sterling and Pilon, have begun to emerge with the sustainability science initiatives at Harvard University (Clark, 2007) and their research with what are called knowledge systems for sustainable development (KSSD) and boundary organizations (Cash et al., 2003). Boundary organizations are collaborative communities created to bridge the divide between knowledge and local action by co-creating valid and effective KSSD. Research indicates that boundary organizations acting at the local-level are best suited for research, development and implementation of KSSD (Berkes, 2007; Cash et al., 2003). A real-world KSSD/boundary organization example is the Pacific ENSO Applications Center (PEAC) which has been a key boundary organization to Southern Africa and the Pacific region by acting as a “hub that connected NOAA climate scientists, the National Weather Service, university scientists, managers of water, emergency services, and agriculture and private

firms. PEAC effectively coordinated the production of an array of forecasting tools that linked global climate models to local hydrologic, coastal, and agricultural conditions” (Cash, et al., 2003, p. 8089).

The fundamental purpose of KSSD has been to link knowledge to action in support of sustainable development and sustainability (Cash et al., 2003). A boundary organization includes managers that interface and manage the interaction and relationship development between communities of experts and communities of decision makers (Jasanoff, 1987; Guston, 1999; Cash, 2001; Cash et al., 2003). One of the initial duties of the boundary managers is to first collaboratively develop the rules, procedures and norms of accountability by which the stakeholders in the boundary organization will abide (Cash et al., 2003).

The primary and perpetual challenge to boundary organizations is that effective and valid KSSD are context driven, evolve over time, and are beyond grand schemes or political panaceas (Anderies, Rodriguez, Janssen, & Cifdaloz, 2007; Meinzen-Dick, 2007; Ostrom, 2007). That is, solutions that work in one setting may not work in another, and may only work for a given time. ESD and sustainability must likewise remain open-ended and evolutionary in process.

Boundary organizations serve to demonstrate the credibility, salience and legitimacy of the knowledge through the generation of commitment and accountability *on both sides of the divide* (Cash et al., 2006; Cash et al., 2003). Going back to the PEAC example,

*PEAC created salient information through close engagement with local managers and decision makers. Regular meetings, workshops, and other communication not only educated water managers, farmers, emergency management officials and the fishing industry about ENSO, but allowed PEAC to learn what information managers need and to adjust questions and answers accordingly. This dialogue produced locally specific forecasts that mobilized expert knowledge about ENSO events in ways that helped local decision makers (e.g., how river flow will change or how rainfall patterns will deviate from the norm on one side versus another side of an island). By promoting communication that bridges the boundary between producers and users of forecasts, PEAC has increased the credibility and legitimacy of the information produced. PEAC's products gained credibility by using data from local resource managers whom local decision makers trust. PEAC's forecasts gained legitimacy by using a process that was transparent, inclusive, and served the interests of the major stakeholders (Cash et al., 2003, p. 8088).*

While the emphasis of the KSSD/boundary organization objectives appears to have been initially cast “to effectively harness S&T [science and technology] for sustainability” (Cash et al., 2003, p. 8086), thus suggesting a unidirectional focus and singular mandate for boundary organizations, we argue that there remains an even greater potential for them. They could serve a larger role and purpose toward achieving global sustainable development and sustainability by generating effective and valid *bilateral* communication, translation and mediation between communities of knowledge and communities of action. In other words, as further detailed in this paper, we see KSSD and boundary organizations as the foundation for an expanded ecology of education for global sustainable development and sustainability.

## **The ecology of education: optimum conditions for transformative learning**

Ecology has always been about the study of the relationships between living organisms and their environment. The scope of ecology in education has, however, expanded over the years from focusing primarily on the science of ecology to an increasing emphasis on teaching students environmental advocacy (Johnson & Mappin, 2005). The study of ecology has thereby effectively expanded to include the sociopolitical and philosophical dimensions of value inquiry relative to human-nature relationships. While the growing need for ecology *in* education, (especially pertaining to environmental advocacy) might be obvious, as we describe in this paper, there is an equally important need to implement an expanded ecology *of* education. Specifically, we argue that the best way to teach environmental advocacy through ecology *in* education is to combine it with a novel ecology *of* education.

We define the ecology of education as the environmental context, both physical and social, within which teaching and learning occurs. An ecology of education in the physical sense speaks to the place in which teaching/learning occurs. An ecology of education in the social sense refers to the character of the dynamics of interactions between teachers and learners, which in this view makes all participants teachers and all participants learners in a collaborative community.

Our focus in this paper is on developing the ecology of education as a learning system that addresses more the “how” of relationships for learning, rather than the content or the “what” of teaching sustainable development and sustainability. Thus, as described further, an ecology of education involves problem based learning within a collaborative community and social science research-based context. An ecology of education is understood in terms of process and process goals and the conditions to which to aspire to best learn the behaviors and attitudes necessary for global sustainable development and sustainability. Thus, it addresses KSSD directly by asking what the most valid and effective learning system conditions are for developing relationships toward a sustainable future. For example, it is widely recognized that behaviors and relationships that reduce exploitation of the environment and of other humans are prerequisites for a sustainable future (Kates & Parris, 2003).

Underlying this ecological approach is the assertion that human nature is amiss with life in schools because these are, often, artificial environments both physically and socially, which run counter to our human biological and social heritage. The vast majority of our biological and social evolution is essentially that of pre-agricultural, pre-industrial heritage when humans lived in small, interdependent, egalitarian bands and clans. Consequently, we do poorly in large formal bureaucratic hierarchies with features so common to schools and school systems such as one-way impersonal communication, information and decision-making denied the majority, and factory and machine-like behavior (cf. Morin, 1999).

An ecology of education provides the essential learning environment to cultivate the necessary wisdom and confidence within students to effectively manage the unprecedented level of information, data, and commercial/political propaganda they are so often exposed to through the media, internet, etc. Additionally, such an approach addresses the multidisciplinary complexity of the challenges related to sustainable development and sustainability in that it seeks to bring the multiplicity of stakeholder interests and expertise into the collaborative learning community setting.

Perhaps the most promising starting point for the research and development of an ecology of education as a transformative learning modality for sustainable development and sustainability is within the context of established KSSD/boundary organizations. Specifically, we suggest that the inclusion of expertise in cultural psychology, value inquiry and action learning/research within the boundary organization interface is an optimal starting-point for research.

KSSD/boundary organization research has, to date, been conducted in the field addressing some of the real-world complex challenges of sustainable development and sustainability (Cash et al., 2003). This, in our view, makes them ideal environments within which to conduct research in an ecology of education because this research would seek to build-upon and extend these established relationships. We argue too, that the implementation of S&T for sustainable development and sustainability, as has been the primary objective of KSSD/boundary organizations to date, would be more ethically grounded if a collaborative social support/inquiry network of social science researchers would be included. Moreover, if students (K-12/college/university) and non-expert community stakeholders were included in an ecology of education/boundary organization research process then there would likely be increased KSSD/boundary organization success in both the short and long-term. In the short-term there would be improved success because the increased inclusiveness improves the transparency of the process. In the long-term the transformative learning the young non-expert learners would experience would help to render future generations with behaviors and attitudes more equitable with global sustainable development and sustainability. In this view then, schools would become members of and participate in boundary organizations, not only on a local level but also along a collaborative global network.

### **Cultural psychology, value inquiry and action research in an ecology of education**

In this section we briefly discuss why cultural psychology, value inquiry and action research are important dimensions of an ecology of education learning approach in KSSD/boundary organizations.

An ecology of education is, to a large degree, described by the tenets of cultural psychology. The focus of cultural psychology is on the processes rather than the structure of cultures. Regarding sustainable development and sustainability, the social processes within and between cultures that help move those cultures away from domination processes and toward those of democratic partnerships have been deemed necessary for a sustainable global future (Kates & Parris, 2003). Cultural psychology considers that the individual is an active agent, rather than a passive recipient, in social and cultural processes. In cultural psychology, as in an ecology of education, the culture-individual relationship is conceived as dialectical and dialogic, not as one-way. Questions within cultural psychology (and an ecology of education) include, “How are ‘culturally important’ ideas and values (such as fairness or democracy) talked about, explained through narratives? How does the individual’s active interaction with such narratives frame their own explanations?” (Haste & Abrahams, 2008, p. 379). Cultural psychology also points to the educational goal of an ecology of education, namely, student development where “‘development’ comprises increasing sophistication in the use of such narratives and in the processes of dialogue and interaction” (p. 379).

Interfacing these views of cultural psychology with the tenets of the philosophy of value inquiry within an ecology of education approach, we argue, is the best foundation with which to engage participants within the collaborative setting of KSSD/boundary organizations. The philosophy of value inquiry, called the “future of philosophy” (Ginsberg, 2001, p. 1), like the philosophy of ethics, considers what is good in general and what is the highest good (Chang, 2001). This process helps “assist the world to appreciate the valuational [*sic*] existence of the human being” (Ginsberg, 2001, p. 4.) and helps replace the “anything goes” of relativism with the primacy of human rights described by pluralism and, by extension, the rights of all humans with respect to sustainability and the human-environment relationship. A consequential product of value inquiry within a collaborative learning approach is the development of critical thinking and moral development in which, “critical thinking can be regarded not only as a higher-order cognitive skill but also as a competence for critical participation in modern society” (Schuitema, Ten Dam, & Veugelers, 2008, p. 84). Similarly, the UN has identified these attributes as important goals for ESD (UNESCO, 2005).

The final dimension of an ecology of education approach is achieved when cultural psychology and value inquiry are combined with action/learning research methodology. The vision here is that smaller boundary organizations (employing action research methodology) are connected to a larger collaborative network in action research and learning. These multiscale action research modules, we argue, will, as previous action research has suggested (Reason & Bradbury, 2006), empower educators and learners to begin to work in highly dynamic, “fluid”, contexts as opposed to fixed and regimented pedagogical type settings. As mentioned previously, solutions to the challenges of sustainable development are themselves “fluid” in that they are context specific in both space and time (Anderies, Rodriguez, Janssen, & Cifdaloz, 2007; Meinzen-Dick, 2007; Ostrom, 2007), thus action learning provides the learning experience and skill-set compatible with ongoing open-ended problem solving conditions. An important feature of action research is that its methodology provides an opportunity for both direct educational (informational) as well as indirect meta-learning (transformational). For example, the collaborative feature and the participatory action dimension together help to reduce participant fear by developing hope and courage within the experience of the collaborative learning (Pyrch, 2007). Action learning includes self-research in the collaborative context that is directed at empowerment and emancipation, along both collective and individual dimensions (Boog, 2003). Most importantly, the action research component within ecology of education “gets the ideas moving” in that it generates collaborative action by learners within their communities, and along networks from the local to the global (Reason & Bradbury, 2006).

Thus far we have introduced the proposal that the KSSD that are generated by boundary organizations including social science experts, members of the non-expert local community and students (K-12, college/university), in networks that link local and international participants, is the next necessary evolution in an ecology of education that can form the basis of a more effective and valid ESD and sustainability. We have described ecology of education as being informed and guided by the tenets and research methodology of cultural psychology, value inquiry and action research.

In the remaining sections of this paper we provide a brief overview of some additional reflections on an ecology of education approach in an ESD and education for sustainability.

### *The ecology of education and the human need of place*

While this paper has emphasized group process and experience through action as the learning context, an ecology of education also seeks to explore the physical context of learning. That is, it involves learners in the collaborative development of the physical learning environment in an effort to make it a place free of commercialization and depictions of consumption and materialism, thus moving toward a place of learning that is physically more congruent with sustainable development and sustainability and thereby a closer reflection of the natural (cf. Alparone & Rissotto, 2001; Hacking, Barratt, & Scott, 2007; Spencer & Woolley, 2000).

### *The ecology of education and the human need for self-determination and terror management*

What is our core motivation for doing the things we do? Why do we exploit the environment and other humans? According to “Terror Management Theory” (TMT) the underlying goal of all of our motivations is self-preservation, a product of our ancestral past based in survival (Pyszczynski, Greenberg, & Solomon, 1997). All our behavior is motivated, according to the TMT, by our fear of death. In sharp contrast, “Self-Determination Theory” (SDT), proposes that other types of human motivations exist (Deci & Ryan, 2000). It suggests that the underlying goal of some human motivation is the growth-oriented needs for autonomy, competence, and relatedness. As Muraven and Baumeister (1997) suggest, not all behavior can be subsumed under a terror theory. Nor can it likely be completely explained by self determination. There is, for example, the evidence regarding altruistic human behavior, which does not appear to be motivated by self-interest neither by management of terror or self-determination (Warneken & Tomasello, 2006). Nonetheless, our fears and low-self esteem can encourage our materialism and our excessive consumer behavior (Mandel & Smeesters, 2008; Rindfleisch & Burroughs, 2004; Rindfleisch, Burroughs, & Wong, 2008). The vision of an ecology of education seeks to generate transformative learning away from overconsumption and materialism by developing behaviors and attitudes rooted in higher self-esteem, hope and courage.

### *The ecology of education and self-organizing dynamic systems*

An ecology of education seeks to interface the various knowledge of participants and the perspectives from a variety of cultures in collaborative settings that are exploratory, reflective and democratic.

Metaphors from complex dynamic systems science can play an important role in the ecology of education. For instance, the concepts of interdependence of system networks and self-organization offer powerful instructional guidelines by providing a model for group dynamics and learner participation (Torre & Voyce, 2007). Metaphors from dynamic systems have proven to be very instructional in that they can provide a new worldview for learners based in the reality of the integrated dynamics of natural systems of which learners can view themselves an integral part (Sterling, 2003).

### *Social integration, health and well being*

Humans value a sense of belonging to a group and, at the same time, a sense of independence (Brewer & Chen, 2007). An objective with the ecology of education approach is to develop both of these in learners at the same time. Paradoxically, research indicates that strong social ties can help motivate an individual to develop behaviors that help generate autonomy, and that this sense of autonomy is highly beneficial for sustainable development of that individual and of the group(s) to which that individual feels belonging. In other words, social groups such as those of a school class involved in a collaborative boundary organization sustainable development project can be utilized to develop motivations toward individual autonomy in learners and these motivations toward autonomy can loop back to support and benefit the overall objectives of the group. As per Ryan, Huta, and Deci (2008, p. 139), these autonomous motivations are:

- (1) Pursuing intrinsic goals and values for their own sake, including personal growth, relationships, community, and health rather than extrinsic goals and values, such as wealth, fame, image, and power.
- (2) Behaving in autonomous, volitional, or consensual ways, rather than heteronymous or controlled ways.
- (3) Being mindful and acting with a sense of awareness.
- (4) Behaving in ways that satisfy basic psychological needs for competence, relatedness, and autonomy.

While helping to generate autonomy in students may seem counter-productive to working together toward global sustainability, research indicates that individuals with the above listed motivations toward personal growth score higher on tests for subjective well being and also rate higher on tests for ecological responsible behavior (Brown & Kasser, 2005). A sense of subjective well being reduces materialism and consumption behaviors (Rindfleisch, Burroughs, & Wong, 2008). Thus, teachers of sustainability need to know that individual goals of autonomy support collective group goals. Furthermore, there is a clear positive correlation between our social ties, social networks and social integration with our physical and psychological health (Berkman, Glass, Brissette, & Seeman, 2000). We conclude that the list of four motivations above specifically and student/group integration in general represent teaching goals that must be utilized as part of the framework for an ecology of education.

### **Why teachers need to know, and how they can implement and assess the ecology of education**

We have attempted to describe some of the factors that we see as critical to the development of ecology of education. While parameters such as participation and pluralism may be understood on an intellectual level, there may be some remaining discomfort amongst teachers about effective and valid assessment and perhaps, even, questions about the academic relevance of an ecology of education approach for students who could perhaps better use their time learning biology, physics, language and mathematics.

Just as the challenges of sustainable development and sustainability are multi-dimensional, the solutions required to solve them ask for a multi-disciplinary approach involving human-human and human-environment relationships concurrently (Clark,

2007; Kates & Parris, 2003). Thus, the ecology of education in ESD and sustainability puts knowledge and research in biology, physics, language and mathematics into practice within a collaborative social context. This sets-up a reciprocally beneficial relationship loop between knowledge (gained through informational learning) and wisdom (gained through experiential and transformational learning).

Given the advantages of ecology of education as described in this paper, how can teachers begin to implement such a learning system in the classroom? While there are a growing number of internet-based national and international organizations (both governmental and non-governmental), that are converging on the development and implementation of curricula for sustainable development and sustainability, we feel the most effective approach to implementation is at the community level. That is, the administration of the school and the school board (either self-directed or as directed by the community) must take the initiative at the local level and participate in a multi-stakeholder boundary organization project at the local level. Once established, the project can connect to boundary organizations in parallel community projects for sustainable development likely most easily through an internet based collaborative forum.

Lastly, how can teachers effectively and validly assess a student's success with learning about sustainable development and sustainability? Conversely, how are a teacher's efficacy and validity assessed? While an ecology of education is exploratory and open-ended and the exact conceptual definition of sustainable development and sustainability will remain uncertain, the demands of the challenges of sustainability and the integrity of the learning process itself calls for some form of testing. Some form of evaluation of both teachers and students is necessary to determine whether progress toward sustainable development and sustainability is being made. As we have described in this paper, ecology of education in general takes the form of an action research project that attempts to solve a community based problem regarding sustainable development. Thus, if the problem is to some degree solved, that can of course be assessed; but what about the process of change in the students and teachers learning? Certainly teachers can be trained and tested in the tenets of cultural psychology, value inquiry and action research. Students can be tested on the biology and physics related to a sustainable development challenge. However, in general terms, an ecology of education seeks to generate transformative learning, developing behaviors and attitudes rooted in higher self-esteem, hope and courage and improved relationships with others and with nature. What about these more metaphysical, yet equally important changes? To this end, we are researching and developing an inventory in the form of a psychometric instrument with cross-cultural applicability that can be utilized to best establish a baseline and measure progress toward individual characteristics consistent with sustainable development and sustainability (Wensing & Torre, 2009). Called the global sustainability inventory (GSI) it is a collage of research proven psychometrics that collectively measure human-nature and human-human relationships. The GSI is comprised of psychometrics such as the nature relatedness scale (Nisbet, Zelenski, & Murphy, 2008), the HEXACO personality scale (Ashton & Lee, 2007) as well as the subjective well being/ecological responsibility/mindfulness scales (Brown & Kasser, 2005; Brown & Ryan, 2003) amongst others (Wensing & Torre, 2009). The GSI is unique in that it seeks to capture and measure the multidimensionality of behaviors and attitudes as described in human-human and human-nature relationships that are equitable with sustainable development and sustainability. It is in that sense a global measure for global sustainability.

## Conclusion

The evolution of the conceptual basis for an ecology of education described in this paper can be followed through the years in other literature (cf. Bennett & Bennett, 2004; Sterling, 2003; Torre, 2003, 2005, 2006, 2007, 2008; Vanderven, Torre, & Maholmes, 2002) and is culminating in a forthcoming text presentation (Torre, 2009). In this paper, we have attempted to consolidate some of the key elements that describe what we see as the necessary evolution of the ecology of education approach to improving KSSD.

Lastly, just as KSSD at best provide solutions in evolution, so too the development of ecology of education is open-ended. As human conditions here on earth change, the values that guide us will likely change as well. We believe that an ecology of education at all levels of learning can help lead us through that change into a positive, peaceful and sustainable future.

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## IMPLEMENTING THE UNITED NATIONS DECADE ON EDUCATION FOR SUSTAINABLE DEVELOPMENT IN LATVIAN HIGHER EDUCATION

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### Abstract

*The article analyzes the implementation of aims and tasks of the UN Decade of Education for Sustainable Development (DESD) (2005-2014) in Latvian higher education institutions (HEI). In the first part of the article the general context of DESD and its' objectives that will be necessary to reach in all levels of education systems are characterized. The second part describes the results obtained from the research on five Education for Sustainable Development (ESD) indicators by considering the situation in two state universities and two regional HEI in Latvia. Educational policies, strategies, curricula, documentations, and different activities in higher education were analyzed in the context of the DESD. Evaluation of the situation in Latvian HEI in general permits the authors to conclude that cooperation on ESD in global context is developed better than local initiatives.*

**Key words:** *sustainable development; education for sustainable development; higher education; teacher education; evaluation; implementation.*

### Introduction

Continuing to exploit the Earth at the present rate endangers the existence of future generations. Human beings have a choice and they can make a difference. One of the ways of getting the message across is to support the younger generation in understanding that there are limits to the Earth's exploitation. Innovations in education toward sustainable development (SD) are the key features that need to be strengthened as to ensure sustainability of human life. In this vein, the possibilities for introducing SD in higher education need to be explored (Filho, 2000; Pipere, 2006; Pipere, 2007). This is a process that includes the assessment of existing initiatives and development of new activities that ought to be adapted to different cultural situations.

Sustainability is a creative, balanced and future-oriented process ensuring continual feedback on ecological, economical and social issues from the people dealing with these issues in a constructive dialogue. The United Nations (UN) Decade of Education for Sustainable Development (DESD) urges agents to encourage changes in behaviour that

create a more sustainable and fairer societies as well as the integration of principles, values, and practices of SD into all aspects of education. These educational efforts will bring about changes in behaviour that, in its turn, will create a more sustainable future for present and future generations. Experience in the implementation of the DESD should be analysed (UNESCO, 2005); assessment of formal, non-formal and informal activities can help to achieve the goals of this Decade and its vision.

A constant monitoring of the initiatives for DESD implementation is needed in every country. The initial context of the implementation of DESD is at the local and national, than global level. The adequate processes of monitoring and evaluation must be put in place from the start. Without that, it will be impossible to know if the process has changed and what differences exist. A key aspect of monitoring and evaluation would be suitable, relevant and measurable indicators at all levels (local, national and global) and for each initiative. Thus, monitoring and evaluation will become an integral part of the new thrusts and directions, which the DESD may stimulate (UNESCO, 2005).

This article describes the results of monitoring and evaluation of implementation of aims and objectives of the DESD in Latvian higher education. Examining the implementation of DESD in Latvia, it is evident that the information on such initiatives in higher education is rather vague and does not reflect the real situation in the field. In the report on the situation of DESD implementation in Latvia (MES, 2007b, p. 11), it is specified that there are activities for enhancing a positive insight of the society as well as for the inclusion of SD in the content of formal, non-formal and informal education at all levels. In order to evaluate the implementation of main approaches to ESD in the educational process, it is necessary to define uniform monitoring criteria.

### **The UN DESD: introduction to global situation**

The DESD is characterized as a political initiative that could strengthen international cooperation towards the development and sharing of innovative ESD activities and policies. Since 1985, the UN has designated International Decades to draw attention to major issues and to encourage international activities on issues of global importance. The historical benchmarks of the DESD are:

- the UN Conferences on Environment and Development (UNCED) “Earth Summit” in Rio de Janeiro in 1992 where 27 principles of the Rio Declaration on Environment and Development, as well as Agenda 21, were developed and accepted;
- the UN Millennium Summit in 2000, where the Millennium Declaration committed society to a new global partnership to reduce extreme poverty, by setting out a series of time-bound targets later known as the Millennium Development Goals;
- the World Summit on Sustainable Development in Johannesburg 2002 that recommended the UN General Assembly to “consider adopting a Decade of Education for Sustainable Development starting in 2005” (paragraph 117d, Plan of Implementation).

In December 2002, Resolution 57/254 on the UN DESD was adopted by consensus. The UN General Assembly resolution designated UNESCO to lead the Decade and

develop a draft International Implementation Scheme (IIS) for the DESD. The IIS is a strategic document that focuses primarily on what nations have committed to achieve and to contribute through the DESD and under UNESCO's leadership. This was the result of extensive consultations with United Nations agencies, national governments, different institutions, nongovernmental organizations (NGO), and experts.

The goals and objectives of the DESD and its relation to other key education movements are summarized by the UN General Assembly. The primary goal for the DESD is laid out in the UN General Assembly resolution 59/237 in which it "encourages Governments to consider the inclusion ... of measures to implement the Decade in their respective education systems and strategies and, where appropriate, national development plans" (General Assembly, 2005, p. 2). Furthermore, the General Assembly "invites Governments to promote public awareness of and wider participation in the Decade, inter alia, through cooperation with and initiatives engaging civil society and other relevant stakeholders, especially at the beginning of the Decade" (General Assembly, 2005, p. 2-3).

The overall goal of the DESD is the integration of the principles, values and practices of SD into all aspects of education and learning to encourage changes in behaviour. It emphasizes the importance of partnership in the eventual success of the DESD and outlines how these might contribute at all levels – community, national, regional, international, continental, and global. The DESD at the national level tends to provide an opportunity for refining and promoting the vision of and transition to SD, possible through all forms of education, public awareness and training. The implementation of SD is important for all formal, non-formal and informal activities, also in higher education.

The objectives for the DESD are to:

- *facilitate networking, linkages, exchange and interaction among stakeholders in ESD;*
- *foster an increased quality of teaching and learning in ESD;*
- *help countries make progress towards and attain the millennium development goals through ESD efforts;*
- *provide countries with new opportunities to incorporate ESD into education reform efforts (UN, 2004, p. 2).*

These objectives include a strategy that enables us to understand others and ourselves. They assign our relationship with the cultural, economical, natural and social environment, as well as the understanding of it all that is the background for building respect. Through the sense of justice, responsibility, equality, and dialogue the DESD objectives persuade us to adopt behaviours and activities supporting values and principles of SD. As well, interlinked strategies (UNESCO ex, 2005) are proposed for the DESD. They will ensure that change in public attitudes and educational approaches keep pace with the evolving challenges for SD. ESD provides values with respect at the centre – respect for others, including those of present and future generations, for difference and diversity, for the environment and for the resources on the planet.

Implementation of the DESD goals and objectives mirror the concern for high quality education and integration of sustainability in the whole curriculum, not as a separate subject. The important perspectives that need to be integrated in the curriculum include peace and human security, human rights, gender equality, cultural diversity and

intercultural understanding, health, governance, natural resources, environment protection, nature conservation, climate change, rural development, poverty reduction. These perspectives are the features of sustainability that are engaged in all spheres of learning: formal and non-formal, informal learning, community-based organizations and local civil society, the continuum from kindergarten through adult education, the workplace, technical and vocational training, teacher training, higher education, policy-making organizations, and beyond. ESD addresses local as well as global issues and uses the language(s) most common for the learners. The outcomes of the DESD will emerge as new attitudes and values, to inspire decisions and actions, making SD a more attainable ideal.

The DESD is a complex and far-reaching undertaking. The best way to implement changes in education is a transdisciplinary approach (Nicolescu, 1997; Wheeler & Byrne, 2003; Marinova & McGrath, 2004) that includes holistic understanding of the world's situation as a starting point for developing a new global consciousness in behaviour and lifestyles. DESD implementation will depend on the strength of stakeholder commitment and cooperation at local, regional, national, and global levels. Networks, coalitions and other partnerships will be the crucial element to reach the goals of DESD in society.

Observing the present situation in Latvia regarding the implementation of the DESD (joint planning and regular information exchange about planned activities) in 2006, the Latvian Ministry of Education and Science, Ministry of the Environment and the UNESCO Latvian National Commission signed a cooperation agreement about building a coordination group on this task (MES, 2008a).

## **Examining the implementation of DESD in Latvian higher education institutions**

### *Method*

This part of the paper discusses the indicators and data on implementation of the ESD in Latvian higher education institutions (HEI). As it is mentioned in the report of the Latvian Ministry of Education and Science (MES, 2007b), for the successful realization of the DESD aims and tasks, qualitative research is necessary that would include evaluation of all levels of the education system, as well as of formal, non-formal and informal education activities. In order to promote a better understanding and realization of this process, it is necessary to summarize the best practice examples in education. National documents with regulative function such as the National Strategic Reference Framework 2007-2013 (MF, 2007a), the Conception for Education and Development 2002-2005 (MES, 2002), the Law of Higher Education (MES, 2007a) were the sources of general information.

The sample selected for this study was two state universities (DU, 2008; UL, 2008) who focus on research and education and two regional higher education institutions (RHEE, 2008; LiepU, 2008) in Latvia focusing mainly on teacher education. Higher education in Latvia (MES, 2008b) has been binary system since the Law on Education Establishments sets a difference between academic and professional higher education but it is not strictly institutionalised. Universities and other HEI mostly run both academic and applied professional programmes oriented towards higher professional qualifications. Some years ago the mentioned regional HEI was only teacher education focused.

Only the biggest university (Case 2) in Latvia aims for students from all Latvia, while the other institutions are more attuned to regional needs (see Table 1).

Table 1. Characteristics of analyzed HEI

Main features of institutions	Case 1	Case 2	Case 3	Case 4
Status	State University	State University	Regional HEI	Regional HEI
Year of foundation	1921	1862	1993	1954
Year of elaboration of development strategy for institution	2001	2004	2006	2008
Number of students	4219	23 801	3269	3302
Number of staff	535	2 620	299	298
Number of teacher education programmes	11	17	12	14

The documents on the development of HEI, constitutions of universities and priorities of their development were used as the main sources of data. Documents regulating the studies of higher education, self-assessment reports of teacher education programmes were analysed for their content regarding the activities related to DESD.

In order to get more detailed information for the analysis, results obtained from the analysis of documents were discussed with representatives of the target group (20 experts – programme directors, researchers and lecturers from these four HEI). This sample consisted of 20 randomly selected participants that represent a significant variety of ethnic and national identity, age, position, and work experience. The participants were asked to identify, define and reflect on different aspects of their activities and their experience within the ESD.

The content of documents and data from the discussions was subjected to content analysis (Hsieh & Shannon, 2005).

## Results

Table 2 displays the expected outcomes, potential indicators and data that could be used to support their verification. This is a starting point for evaluation of each initiative on DESD in HEIs in Latvia.

Table 2. Monitoring and evaluation of DESD activities: Indicators and data (adapted from UNESCO ex, 2005, p. 43-44)

Expected outcomes	Potential indicators	Source of verification
Assessment of the need for and role of ESD in HEI development planning and documents	SD factored into development plans and priorities	Points with ESD or SD component in development planning documents
Growing cooperation among ESD initiatives	Creation of ESD networks and alliances, joint programming between government, HEI and NGOs	ESD in proceedings and other meeting outputs, membership of ESD networks and alliances, joint initiatives and participating in them

*Sequel to Table 2 see on p. 23.*

*Sequel to Table 2.*

Broad public awareness of the nature and principles of SD	Participation in local, practical SD initiatives, events, campaigns	Initiatives and levels of participation
The thread of SD woven into education efforts to raise educational quality	Use of SD themes in education	HEI with SD in education curricula
High-quality materials and methodologies in ESD	Relevant materials available in learning situations and learning	Materials, distribution and rates of adoption, in-service teacher

The acquired data was coded according to five expected outcomes suggested by monitoring and evaluation of DESD (see Table 2), and then HEI experience on each outcome/indicator was explored.

### *Assessment of the need for and role of ESD in HEI development planning and documents*

As argued in national development documents (MF, 2007a) and other national documents with regulative function (MES, 2002; MES, 2007a), one of the strategic aims of education is a cultural, social and economic development of country provided by the highly educated population. Examining the data on the first outcome, the main problems in Latvian higher education illustrating the situation of researchers and academic staff are: inadequate qualification and competitiveness of the labour force, lack of integration of higher education and science, small number of doctoral students (1.5% of students' total number, while 5-6% in other EU countries), age of the academic staff, and decreasing number of faculty with academic degree (MF, 2007b, p. 21-27; CM, 2001). As outlined in the Conception of Educational Development for 2002-2005 (MES, 2002), to solve these problems and provide the education in the context of lifelong learning, the main task is "to provide the availability of education and equal education possibilities, because social segregation of several social groups endanger the sustainable development of a society" (p. 14).

Evaluation of documents that regulate higher education shows that the horizontal priorities of National Strategic Reference Framework for 2007-2013 (MF, 2007a) are territorial development, macroeconomic stability, equal possibilities for all, sustainable development, and informed citizens.

The concepts of SD and ESD have not been mentioned in any of the four HEI constitutions, strategic aims and tasks of HEI. Analysis of the outlined priorities proves that while these concepts are not included, synonymous concepts are used instead. For example, one of the HEI goals in Case 1 is to promote the development of entire country, Latgale region, as well as the human wellbeing. HEI mission in Case 2 determines that HEI is a guarantee for the development of Latvia. Key words are integration, consideration of European standards and cultural cooperation. In Case 4 the preservation of traditional knowledge in order to maintain national language, culture and traditions is mentioned as an important aim.

### *Growing cooperation among ESD initiatives*

Examining the data on the second outcome in all four HEI, it was discovered that the academic staff of these HEI has participated in a large number of international activities and projects. There are personal contacts with other HEI, NGO and organizations influencing the situation; however, there is no evidence of internal cooperation between the involved institutions.

One of organizations involving all four HEI is the Latvian Council of Environmental Science and Education. This organization includes representatives from different HEI, scientific institutions and ministries and works in the field of SD, environmental science and education.

Cooperation on ESD between HEI and NGOs are in place for all four HEI. Among them are Green Centre Liepaja, Centre for the Baltic Studies and Association of Education for Sustainable Development, which carries out some ESD projects and activities in cooperation with students, academic staff and society.

Concerning the ESD global networks and alliances, the academic staff of HEI in Case 1 has participated in the development of the DESD guidelines (UNESCO, 2005) and their achievements have been acknowledged as examples of good practice of implementation of the DESD (UNESCO, 2007a; UNESCO, 2007b). This HEI is also a member of the Environmental Management for Sustainable Universities (EMSU) and other networks. The Baltic and Black Sea Circle Consortium in Educational Research (BBCC) has been established as an initiative of international cooperation between educational institutions. The task of the BBCC is to serve the DESD (UN, 2004) on two levels of the activities: (a) the general level where the theoretical background of sustainable education is acknowledged and studied and (b) the specific level where SD as a cross-curricular issue is implemented in teacher education.

The HEI in Case 2 strives to intensify different types of exchange and to widen possibilities for internationalization of studies and research by participating in international university organizations and through active membership in networks such as The European University Association, Network of Universities from the Capitals of Europe, Baltic Sea Region Universities Network, CAMPUS EUROPÆ and UTRECHT Network.

### *Broad public awareness of the nature and principles of SD*

Examining the data on the third outcome, it is clear that all four HEI organize conferences that feature SD. For example, the annual international JTET/JTEFS conference “Sustainable Development. Culture. Education.” is established as a meeting place of BBCC. In this context, international discussions focused on the content of the terms ‘sustainable development’, ‘culture’, ‘education’ and the integration of their content are conducted.

Other HEI hold annual conferences where SD is one of the featured topics, e.g. International Conference “Environmental Science and Education in Latvia and Europe” organized by the Latvian Council of Environmental Science and Education (LCESE), International Conference “Content of Environmental Education in HEI” organized by the HEI Case 2, annual conference by the HEI Case 2 or International Conference “Society. Integration. Education.” organized by the HEI Case 3 and International Con-

ference “Person. Colour. Nature. Music.” held at the HEI Case 1. Frequently, during these conferences the understanding of SD is reduced to a single issue, e.g. the issue of sorting waste. However, it is necessary to look for interconnections that would permit interpretation of the notion of SD in a way that would be comprehensible for an audience of any age or level of expertise.

Several national and international projects have been implemented and followed-up. For example, the HEI in Case 2 participated in the 5th and 6th RTD Framework Programmes, EU, UNESCO and other projects, that ensured the integration of studies and research and allowed to develop Centres of Excellence, e.g. UNESCO Department at the Institute for Environmental Studies and Management. Some of these national and international projects at the different HEI contribute to issues of SD within education (BUTC, 2008; DU, 2008; UL, 2008; LiepU, 2008; RHEE, 2008).

In the HEI Case 1, research has been conducted on sustainability in teacher education (formal, non-formal and informal) and educational action research has been elaborated as a research method. Also, research institutes were founded, such as the Institute of Sustainable Education (ISE). The strategic aim of ISE is commitment to meta-curricular issues, the holistic approach to education and ESD. These activities contribute to infusion of the concept of SD in Bachelor, Master and Doctoral programmes in education and management. The fundamental principles for achieving this aim include: (1) complementarity of academic and research activities, (2) integration of meta-curricular, cross-curricular and curricular content, (3) implementation of the issue of sustainability within education, (4) research of regional educational issues, (5) integration of collective and individual frames of reference, and (6) encouragement of creative activities, cooperation and adaptive management.

Another example for HEI Case 1 is the Latgale Sustainable Development Research Institute that focuses on supporting and implementing research in the spheres of conservation of environmental quality, optimization of national economies, exploitation of resources, and implementation of ecological technologies.

These research institutions organize different activities such as conferences, research, projects and publication that promote public awareness of the principles of SD. Various local practical SD initiatives, events and campaigns are organised. The most popular activities are joint work to clean the surroundings and various student initiatives, e.g. surveys, research pilot projects. Though, they should be organised more often and should include wider community. All the ongoing activities need to be a priority of the entire institutions, not merely of separate faculties or individual.

### *The SD for the quality education*

Examining the fourth outcome, the collection of the data was mainly focused on teacher education programmes implemented in all selected HEI. All preschool and primary school teacher professional study programmes contain courses focusing on themes relevant to SD, such as environmental education or ecological education. Concepts of SD are addressed in Case 3 and ESD is coursework in Case 1. Essential aspect of these study courses is a learning environment that is problem-based, ecocentric and based on social changes, which encourages learners’ understanding and positive attitude toward global changes, cultural and biological diversity in the world.

In terms of experts' discussion, the majority of participants stressed that faculty and students should understand the importance of diversity and inclusion, as well as to be able to identify values, assumptions and ethical systems in order to make their own decisions. Higher education has to emphasize experiential, inquiry-based, problem-solving, interdisciplinary approaches and critical thinking. Curricula need to be developed, including content, materials and tools such as case studies and identification of best practices.

Exploring the study courses with relation to ESD as elaborated in all four HEI, it was found that the course targeting ESD most precisely was designed by the Institute of Sustainable Education at HEI Case 1. There are many other study courses directly or indirectly related to ESD in the HEI Case 2, Case 3, and Case 4, in Riga Technical University, Latvian University of Agriculture and other study programmes at the university and college levels. The environmental aspect dominates the content of many of the courses and usually is understood as environmental protection and nature conservation. Also economic and social aspects are integrated or pointed out. But contrary to environmental education (McKeown & Hopkins, 2007), in ESD environmental aspect ought to be complemented with the economic, cultural and social aspects of SD. Experts (representatives of the target group) agreed that a course on ESD is necessary in all teacher education programmes. But there is still no definitive answer to the question of whether or not to integrate this subject into the curriculum. The questions, whether this course should be compulsory or optional, how to motivate students to choose the course and what it should contain, are still to be discussed in detail.

### *High-quality materials and methodologies in ESD*

In general, several academic publications on SD and ESD are developed. Two volumes of the international article collection "Education and Sustainable Development: First Steps toward Changes" (Pipere, 2006; Pipere, 2007) have been published and the international peer-reviewed *Journal of Teacher Education for Sustainability* (JTET/JTEFS) was launched in 2001 (ISE, 2008). The mission and major goal of the journal is to serve teachers, teacher educators, educational researchers, and policy makers by providing a platform to broaden the focus of local theoretical and practical approaches to teacher education with a global perspective, thus ensuring the contribution for a sustainable future. In all HEI theoretical elaborations and teaching materials on SD (Kļaviņš, 2008; Liepiņa, 2008) are published. Research on ESD is undertaken in Bachelor, Master and Doctoral studies.

To implement ESD in higher education, it is necessary to prioritize ESD issues in national and international policies, and to create training materials available for formal, non-formal and informal educational activities. Shortage of resources impedes publication of more high quality issues.

## **Discussion**

Many HEI, government agencies, policy makers, and NGOs worldwide have significant impact on reorienting the existing documents and laws, as well as academic and professional educational programmes and community activities toward the aims of DESD.

Governments began with steps to reorient national educational policies and systems toward ESD. Partnerships between government, institutions, organizations and civil society encourage implementation of SD. It is important to assert for a more intensive and coordinated cooperation on implementation of ESD in accordance with the declarations of the DESD, Vilnius Strategy (UNECE, 2005), UNECE 6<sup>th</sup> Ministerial Conference in Belgrade (UNECE, 2007) and Ahmedabad Conference (CEE, 2007). It is important to include paragraphs with ESD or SD component in HEI development planning documents; all the ongoing activities need to be the priority of the entire institutions, not merely of separate faculties, institutes or members of academic staff. In general, each institution committed to sustainability has to find its own way of defining sustainability, as Calder and Clugston (2002, p.631) suggest, an institution has to frame its own basic understanding of “(1) the complex environmental, social, and ethical issues that must be addressed to create a sustainable future, and (2) the nature of the political, organizational, and individual responses needed”.

Experts in the sphere of ESD from Estonian, German, Latvian, Lithuanian, Russian and Swedish educational institutions, foundations and NGOs highly evaluate the positive achievements of ESD in the Baltic Sea region in their declaration as witnessed during the international conference “Education for Change: From Theory to Practical Action” (BUTC, 2008) and point out the necessity to continue the development. The conference participants underlined the regular examination of experience and ongoing activities in the sphere of ESD and the continuation of initiated discussions by inviting experts and representatives from all educational institutions and interested organizations. International experts encourage setting ESD as a priority in teachers’ professional development, inclusion of a course on ESD in all study programmes in teacher education and continual development of this course at all levels of higher education.

The quality of materials and methodologies and educational quality in ESD is of concern, as some academics find the concept of sustainability too abstract and broad (Filho, 2000; Davis, Edmister, Sullivan, & West, 2003) and generally confine interpretation to their individual disciplines. More comprehensive elaborations in the sphere of ESD have been developed in Case 1 and Case 2 of the presented research, which is related to a greater governmental financial support for research in state universities, the capacity of academic staff and greater experience in international projects.

Evaluation of the situation in Latvian HEI in general permits to conclude that cooperation on ESD in global context is developed better than initiatives in local context. This could be related to the initial political situation and the understanding of the topicality of ESD in Latvian education. There are still many unsolved issues that indicate the areas that need greater governmental support, for example, to advance ESD as a priority in teachers’ professional development, educational standards, teacher training curriculum and curriculum of all types and levels of formal, non-formal and informal education, to include ESD as a criteria for course book evaluation and in the content of final national examinations. There are more discussions needed to further address these issues; inviting representatives of all Latvian universities and HEI, as well as other experts and interested institutions would support such endeavours.

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## DEVELOPING THE MODEL ON THE LEARNING FOR SUSTAINABLE DEVELOPMENT IN HIGHER EDUCATION

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### **Abstract**

*The study highlights how higher education institutions could be proactive leaders in promoting societal change for sustainable development. In total, 30 researchers and teachers of Education for Sustainable Development (ESD) from universities in the Baltic Sea Region participated in the development of a model on learning for sustainable development by introducing educational cases and developing the important factors of ESD, based on these cases, their own experience and theoretical knowledge. The critical factors of ESD were re-developed and categorised into contextual (integrative approach, time perspective and spatiality), mental (value clarification, systemic thinking, critical reflection and motivation building) and activity (partnership, cooperation, communication and participation) related aspects. By using these critical factors in higher education, teachers can more likely ensure that the outcome of the learning process will increase competences for sustainability. The development of the model was based on a constructive research approach rarely used in pedagogical research. Therefore, the study increased the understanding of participants about this qualitative research tradition.*

*Key words: Education for Sustainable Development; higher education; constructive approach; Baltic Sea Region.*

### **Introduction**

The general framework of the study described in this article is determined by the global, regional and local strategies and concepts of Education for Sustainable Development (ESD). From the Baltic Sea Region perspective, the Baltic 21E Programme (Baltic 21E, 2002) is of special importance. The aim of this programme is to enhance the role of ESD in the Baltic Sea Region so that the various dimensions of sustainable development become a natural and permanent component of educational systems. In order to fulfil the targets set by the United Nations (UN) and the Baltic 21E Programme, the Finnish Ministry of Education launched a national strategy for the UN Decade of Education for

Sustainable Development (DESD) as the first national DESD strategy in Europe (Ministry of Education, 2006). This strategy envisages the whole educational system in Finland to act as a proactive leader in creating change for sustainability, and thus, is an innovative example of how to promote ESD at the national level. In the national strategy of Finland special emphasis is placed on the importance of research and development in cooperation with other Baltic Sea countries. The study outlined in this paper is one example that responds to this challenge from the perspective of higher education.

Promoting sustainable development, institutions of higher education can choose between two different roles. According to the first one, institutions of higher education are merely indicators of changes in attitude and knowledge within a society, and themselves cannot provide the impetus for change. The basic assumption behind this thinking is that educational institutions are created by society, and are therefore a reflection of it and are in no way a real force for social change (Wright, 2006). The other view states that institutions of higher education can and/or should be proactive leaders in promoting societal change (Giroux, 2005; UNESCO, 1997). The latter view constitutes the basic assumptions and guides the research question underlying this paper: How can higher education institutions be proactive leaders in promoting societal change?

### **Constructive research approach**

The study is based on a constructive research approach, which can be classified as a part of the qualitative research tradition. The constructive approach has been used extensively in medicine, mathematics and technical sciences. However, the approach is used not so often in pedagogical research (Rohweder, 2008a). This research tests a suitability of constructive approach in developing ESD, and thus gives the understanding of its applicability for pedagogical research.

The starting point in the constructive research approach is a practical problem that should be solved. The goal is to develop a construct based on practical information, theoretical knowledge and heuristic development process. Therefore, the constructive approach gives new input to both theoretical argumentation and praxis (Lukka, 2000). The constructive research approach can only be chosen if researchers participating in the project have a deep understanding of the phenomenon both on the practical and theoretical level, which was the case in this study.

After determining the need for theoretical and practical development and formulating the research question, the first task in the constructive development process is to define the theoretical “framework”. Tilbury and Cooke (2005) have defined the critical factors of the learning for sustainability as follows: envisioning a better future, systemic thinking, critical (reflective) thinking, participation in decision making as well as networks and partnerships for change. In addition, future orientation, value clarification, cultural thinking, participation in planning and learning, relevance and capacity building should be taken into consideration in the learning process for sustainability (Tilbury & Ross, 2006). Similar approaches are introduced by UNESCO in the declaration of the DESD, which highlights that ESD should be interdisciplinary and holistic, values-driven and locally relevant, and should promote critical thinking and problem solving skills (UNESCO, 2004). These critical factors of learning for sustainability were chosen as the theoretical starting point for the construction process, and thus their relevance was under consideration.

The construction phase was conducted by analyzing the practical information and the critical factors mentioned above. Practical information was gathered by organising four workshops and obtaining descriptions of eight teaching cases. The analysis of practical information was performed by the methods of text and content analysis.

The collection of practical information was initiated by setting up the model development group in the seminars organized by the Baltic University Programme (Borki Molo, Poland, March 2006) and by the Baltic Sea Sustainable Development Network (Pskov, Russia, September 2006). In Borki Molo, twenty teachers and researchers who specialized in ESD joined the project, and in Pskov an additional nine experts from the Baltic Sea Sustainable Development Network expressed their willingness to contribute to the development process. Involving teachers from the field of ESD ensured the relevance and usefulness of results for the practical work. The workshops were organized as collaborative and participatory development work where the teachers considered the theoretical foundations of the project (critical factors of ESD) in relation to their own teaching experience and expertise. In addition, the participants introduced their teaching cases, and the most innovative of them were selected as the empirical material grounding this study.

Drawing on the critical factors of ESD, the partners' descriptions of innovative teaching experiences (teaching cases) and the discussions with the partners via e-learning methods, the project managers used the content analysis method to analyze the results of the workshops and the method of text analysis for the teaching cases. Overview of cases is provided in the next section. Analysis of workshops and teaching cases permitted the authors of the article to construct the first proposal of the redeveloped critical factors of ESD.

Two other collaborative workshops were organized to further develop the critical factors of ESD presented by the project managers. A total of 22 teachers and researchers participated in the workshop, which was organized during the Baltic University Programme Conference in Lodz, Poland (May 2007). In the workshop, the project managers presented the first redeveloped version of the critical factors of ESD, and the participants collaboratively developed it further. The teams were encouraged to have a creative and critical approach. The workshop ended with presentations by the teams, which were followed by lively discussion. As a result of the workshop, the project managers made the second proposal of the critical factors for ESD. It was introduced and developed further in the workshop carried out during the Baltic Sea Sustainable Development Network Conference in Neubrandenburg, Germany (October 2007). A total of 19 teachers attended the workshop. After the project managers had presented the new version of the critical factors, five teams were formed to develop the proposal further once again. At the end, the project managers drew the final conclusions regarding the categorization and re-conceptualization of the critical factors of ESD and formulated a model of learning for sustainable development.

### **Description of the teaching cases**

This section describes the teaching cases used as the practical information in the model construction process. The full description of cases is provided in the publication *Learning for a Sustainable Future – Innovative Solutions from the Baltic Sea Region* (Rohweder & Virtanen, 2008). The cases introduce eight ways to integrate sustainable development

in higher education in Russia, Finland, Germany, Ukraine, Poland and Estonia. The cases give insights into the innovative solutions of ESD and establish the background for developing the model of learning for sustainable development.

The first case is an example from Russia. It introduces how sustainability has been integrated in education at the university in St. Petersburg. The innovative idea is to improve the educational system so that it would stimulate the creation of a new mentality of people in the 21<sup>st</sup> century – the new generation that will be able to bring nature and humankind toward sustainable development. In addition, the case introduces the importance of networking in promotion of ESD. The case argues that wide-spread multicultural and interdisciplinary co-operation is an important part of ESD (Ionov & Shelest, 2008).

The first case from Finland describes the basic ideas and the pedagogical background of the innovative competence-based core curriculum prepared at Laurea University of Applied Sciences as a way to integrate sustainable development into education. The curriculum renovation has encouraged a change in the whole organisational culture. Teachers need to re-orientate in their work and see students more as partners than as “objects”. Sustainable development is understood as part of every individual’s activities, not only as a matter of teachers who are especially devoted to it (Virtanen, 2008).

The second Finnish case is about oil combating education as a proactive way to prepare people for a potential oil spill. The case brings out an example of a study course that is based on the idea to enhance a holistic understanding of an oil spill and oil combating from the sustainable development and managerial point of view. The education is based on critical, reflective and collective learning. Open learning environments are seen as a basis for lifelong learning, and in given case the learners were both professionals and university students (Rohweder, 2008b).

In the German case different innovative teaching methods to use in education for sustainability at the university level are introduced. All the methods emphasize participation, demand that students become actively involved and contribute intellectually through problem solving. The case describes appropriate strategies and methods that will allow students to acquire the necessary competencies in problem solving and shaping social, economic, technical, and ecological transition towards a sustainable future (Grothe & Schmeling, 2008).

The first Ukrainian case introduces two interdisciplinary courses of ESD by combining the fields of transportation, psychology and life safety. The innovative idea in the case is the creation of an intellectual transport system, the use of the matrix of the transportation flow and ecological control on the streets and how this information is transmitted to electronic big-boards through the channels of ITS communication (Zinko, Horal’, Lozovyj, & Makovejchuk, 2008).

The second Ukrainian case stresses the importance of ethics when we talk about sustainable development and attitude toward nature. The important starting point in the case is to see the world as an integrated system, and in that way, the case is an example of how systemic and holistic thinking can be implemented in education. The case also stresses the importance of partnerships and networks between the communal organisations and educational institutions (Horal’, 2008). The case as such is an example of an innovative way to handle the subject of sustainable development – as an academic writing and an artistic production.

In the Polish case study the emphasis is on the dynamics needed for the transition to sustainable development. The critical features of the case are the multi and trans-disciplinary connection of many disciplines, systemic thinking and participation. The study course presented in the case integrates disciplines from ecology and economy to social studies and psychology. Simulation and systemic thinking methods help the participants to communicate, work together and integrate the complex ideas of how society and nature are changing (Krolikowska, Magnuszewski, Magnuszewska, & Sendzimir, 2008).

A case from Estonia argues that teachers and educators have a key role in learning for sustainable development. The authors describe the sustainable development study courses that have been taught in Tallinn University to the teacher education students. Various methods are useful in ESD, such as debate, educational visits, seminars and e-learning methods (Elvisto & Henno, 2008).

### **Critical factors for sustainable development in higher education**

The outcome of the model development was the categorization of critical factors of ESD that describes how to enable universities to be proactive operators for sustainability in a society. In the model the critical factors of ESD are divided into context, mental and activity related aspects. Contextual factors form a framework, while mental aspects refer to intrinsic changes in the learning process for sustainability. Activities are the ways to realize educational practices for sustainability (Figure 1).

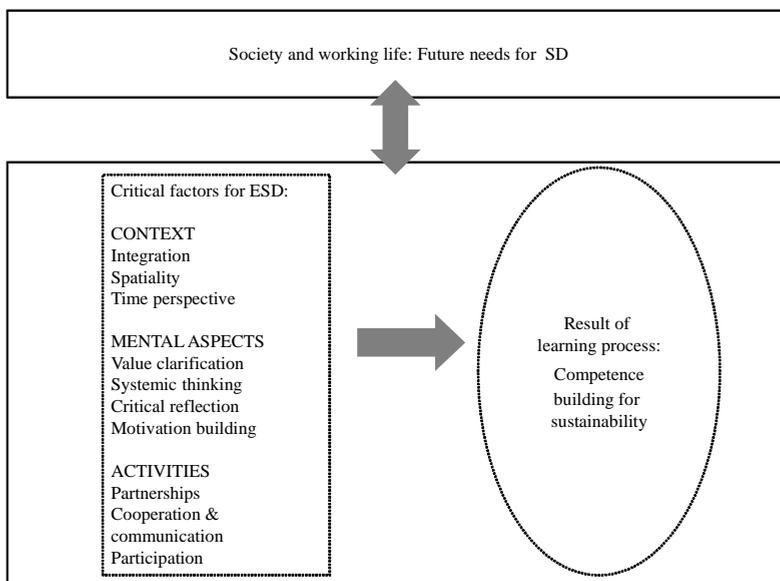


Figure 1. The model of learning for sustainable development

The Figure 1 can be briefly explained as follows: needs for ESD are based on the contemporary as well as future needs of competences to promote sustainable development

in working life and in society at large. The critical factors for ESD are context, mental and activity related aspects. The outcome of the learning process is competence building to promote activities for sustainability. The central feature in the model of learning for sustainable development is interaction between universities and society. Adopting this kind of transformative learning circle offers possibilities for universities to be proactive actors in societal change.

Context-related critical factors for ESD are the integrative approach, spatiality and time perspective. Mental aspects are related to value clarification, systemic thinking, critical reflection and motivation building. The third category, activities, has to do with partnership, cooperation and communication as well as factors related to participation. Now we will bring a more detailed explanation of each of these factors.

*An integrated and interconnected approach* for sustainable development is the basis for understanding and treating the world as a harmonious entity. An integrative approach means, first of all, understanding the causal links of the dimensions of sustainable development, and handling these as interconnected and integrated with each other (Rohweder, 2007; Virtanen, 2007). Ecological questions are not separate from economic, social and cultural ones, and vice versa.

It is not easy to find something more multidisciplinary, transdisciplinary or interdisciplinary than sustainable development (Holmberg & Samuelsson, 2006). Traditional discipline-based structure of education is not enough for education for sustainability. In order to learn about sustainable development, an understanding of several disciplines is needed. Reconnection and reconstruction of traditional educational study fields and scientific disciplines offer new possibilities for learning that emphasize a holistic and interdisciplinary approach to develop knowledge and skills as well as a necessary change in values, behaviour and lifestyles to promote sustainable development (Melén-Paaso, 2007). Wals and Corcoran (2006) use the concept of transformative learning, which requires competence building to integrate, connect, confront and reconcile multiple ways to look at the world.

In educational practices, an integrative approach becomes apparent both at the curriculum and the course level. At the curriculum level, the integrative approach means that sustainable development is not a separate course or field of study – it relates to every branch of higher education as a wider viewpoint. At the course level, the integration means to consider all dimensions of sustainability, although the focus can be on one dimension. Multidisciplinary, transdisciplinary and interdisciplinary approaches are needed for learning. For teachers in higher education, it is a challenge to understand the linkages between disciplines and to mould teaching practices towards a multidisciplinary approach and teamwork. However, this can also be a great opportunity to share knowledge, learn together and solve problems collaboratively.

*Spatiality* is important in the discussion of sustainable development. Learning for sustainability needs a transgeographical shift, that is, looking at sustainability issues from local to regional and global perspectives (Wals & Corcoran, 2006). The lenses to analyse and interpret are worldwide, but at the same time the interest to manage, handle and reconstruct practices is locally oriented. In teaching situations, spatiality and time perspectives form a context as well as a perspective for learning.

*The time perspective* is a focal aspect in learning for sustainability. Future thinking is very significant, but without knowledge about the causal links and reasons for unsustainability it is impossible to reformulate our habits and transform the world

towards sustainability. The determination and envisioning of qualities and criteria for the sustainable future are important in the learning process for sustainability. Having a clear vision of the sustainable future, it is possible to find tools to reach it step by step.

Envisioning should be the starting point of learning for sustainability in which people begin to feel engaged, empowered and responsible to act in ways to reach their vision for a sustainable future. The aim of envisioning is to create a positive and proactive approach to sustainability (Tilbury & Ross, 2006). Envisioning reconstructs the values for society and environment in a new way, and in addition, it forms a motivation for activities for sustainability. For the teacher, methods such as future thinking are feasible.

Dealing with *attitudes and values* is seen as important in the process for sustainability (Lundholm, 2006). Discovering and reconstructing values can be seen as essential steps in the process of learning for sustainability. The question is on reflecting, articulating and arguing the reasons for unsustainable behaviour and an unsustainable world. In addition, the question is to reveal the barriers and possibilities to transform the attitudes and activities for sustainability. Revealing the values behind the everyday practices is a beginning for the journey to transform the individual habits, the workplace and society at large toward sustainability. In value clarification, people explore the links between their assumptions, biases, culture, decision making and actions (Tilbury & Cooke, 2005). Value clarification is a useful method in teaching when exploring and reflecting on people's attitudes, opinions and values.

*Systemic thinking* is a way to outline the complexity of a system and the connectivity of its parts. Systemic thinking offers a way to understand and manage complex processes as it emphasizes a holistic and integrative approach. Concepts such as combined thinking, integrative thinking, relational thinking and holism are used to refer to systemic thinking (Tilbury & Cooke, 2005). Systemic thinking leads to re-evaluation and reconstruction of a fragmentary and reductionist worldview, which traditionally underpins the curriculum in educational institutions. Systemic thinking challenges us to formulate higher education according to the principles of interconnectedness, holism, and an interdisciplinarity and cross-curricular approach. Teamwork and collaboration between disciplines offer possibilities to see beyond separate disciplines, to combine knowledge and define new multidiscipline concepts and solutions for sustainability.

*Critical and reflective thinking* helps to construct the individual and group capacity for learning for sustainability. For instance, UNESCO (2002) has declared critical reflection to be an important element of ESD:

*Education for sustainable development must explore the economic, political and social implications of sustainability by encouraging learners to reflect critically on their own areas of the world, to identify non-viable elements in their own lives and to explore the tension among conflicting aims* (p. 11).

Critical and reflective thinking challenges us to find a new interpretation for our activities, workplaces and the whole world. Reflection can be viewed as a critical self-evaluation of our work, thinking and everyday practices. Critical reflection also means discussions and open dialogues with colleagues. A critical viewpoint encourages us to reconstruct our understanding of the world and its political, economic and social structure (Tilbury & Cooke, 2005). Critical reflection on its highest level demands students, teachers and other stakeholders to question their preconceptions of issues and create new or modified interpretations to understand and realize activities for sustainability.

At an individual level learning for sustainability means to *build motivation, knowledge and skills*. Motivation, knowledge and skills are intertwined; motivation is an inspirer for the search of knowledge and mastering of skills to act for sustainability. A teacher's role is to build the motivation towards sustainable practices, to transfer knowledge of sustainability, and to teach how to act and behave in terms of sustainable development.

The sustainability also requires new kinds of *partnerships*. Ideally, partnerships for sustainability are based on a collaborative culture. Such partnerships can be established between the educational communities, public organisations, non-governmental organisations, local communities, entrepreneurs, etc. By bringing together different groups from different sectors with diverse knowledge and skills, partnerships can build collective knowledge through social learning. In addition, for learning for sustainability an effective and open-minded participation of all stakeholders is necessary. In order to be successful, partnerships require trust, open dialogue and communication, defined and accepted roles as well as transparency and accountability with attention to the issues of equity and fairness (Tilbury & Ross, 2006).

*Cooperation and communication* between institutions of higher education is important, but to fulfil their service functions for the workplace and society, cooperation with external stakeholders is required. Institutions of higher education will have to be centred in international, national and regional networks as well as in networks with other partners, such as primary and secondary schools, vocational education, science centres, companies, NGOs, national and regional governments, etc. (Dam-Mieras, 2006). Cooperation and communication assure a proactive nature for education. When education reflects and corresponds to the workplace and society's needs, it has a powerful capacity to produce competencies for the future needs.

*Participation* requires involvement on different levels starting from the consultation and consensus building to decision making, risk sharing and collective partnerships. In ESD, participation is connected to decision making for sustainability and to wide participation of students and other stakeholders in the learning process. Through participation people can build knowledge and skills as well as take responsibility for outcomes. Participation occurs through active involvement and dialogic discussions. Participation in the learning process for sustainability is an important instrument to recognise the value and relevance of local and context-specific issues (Tilbury & Cooke, 2005). By using various learning tasks that involve teamwork, the participatory character of teaching can be strengthened.

*Competence building* for sustainability is a result of the learning process and development at individual, organisation/community and institutional/societal levels. At the individual level, competence building equips individuals with the motivation, understanding, skills and access to information, knowledge and training, which enables them to perform according to the principles of sustainable development. Learning and development at the organisation or community level form the management structures and processes, and everyday activities for sustainable development. Competence building at institutional level introduces the changes for sustainability in legal and regulatory systems as well as in other social structures.

## **Challenges for higher education and reflections on the development process**

The model of learning for sustainable development introduced in this article proposes not only new challenges, but also new possibilities for teachers in institutions of higher education to enhance the quality of their teaching. The model offers a framework to reorient teaching not only by content, but also by methods. As learning for sustainability is not only transference of knowledge, reorientation of values and habits, creation of experiential learning situations and critical reflection are needed. Teaching and learning in multidisciplinary teams offers the possibility to see beyond the limits of traditional disciplines and to find new solutions to combine knowledge from different disciplines thus promoting holistic and systemic thinking. In addition, working in multidisciplinary teams (consisting of work life representatives, teachers and students) means that the teacher's traditional role as a mediator of knowledge starts to change. In this kind of praxis-based teaching the teacher is a facilitator, mentor, developer and a colleague not only in the university context, but also in a wider social context. The important target is to promote a transformative learning circle, in which not only students but also teachers and work life representatives learn together by solving problems and developing new innovations for sustainability.

The constructive approach used in the development of the model was a challenge since only a few theoretical references about its suitability for pedagogical research are available. However, according to our understanding the opportunities it offers for pedagogical research have not been revealed fully yet. We argue that the constructive approach is highly relevant in the research tradition of applied sciences, which ESD evidently represents. From a constructive point of view the research and development process was successful because it shows an example of collective and participative learning, critical reflection and collaborative competence building. The biggest challenge of using the approach is connected with reliability and validity related aspects. The validity and reliability of the study was established by describing the whole development process of model in detail. Thus the reader can follow how the forming of the project group, collection and analysis of research data as well as the rest of the construction process was performed.

The final result of this project is not an end in itself or the only acceptable solution to the wide and complex question of how to define the critical factors of education for sustainability. Hopefully, the model and the critical factors presented in this paper will stimulate further discussion on how to teach sustainable development and how to enhance the learning process for sustainability. As there is no universal definition of sustainable development, there can be no universal model of how to promote sustainable development in higher education. On the other hand, it is of utmost importance to open our eyes to multiple solutions in this regard.

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## REACHING THE SOCIAL COHESION IN EDUCATION: PERSPECTIVE OF LITHUANIAN TEACHERS

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### Abstract

*The role of the teacher in the educational process has to be reconsidered within the process of social change. Social cohesion can be viewed as an integral part of sustainable development, based on an integrated, holistic approach to economic, societal and environmental development. The role of teachers needs to be reoriented toward the promotion of social cohesion in education, considering the different subcultures that are present. The empirical study described in this article was carried out in Lithuania as a stage within the VI Framework Project “Strategies for Inclusion and Social Cohesion in Europe from Education”. A semi-structured interview designed by an international team was conducted with eight primary school teachers from a Kaunas region basic school. The data obtained through the interviews was subjected for content analysis. The paper concludes that the interviewed primary school teachers tend to act as representatives that enhance the subculture of sustainability.*

**Key words:** teacher; social cohesion; subcultures; cooperation; sustainability.

Globalisation is multifaceted phenomenon which is characterised by many controversies. Present reality can be described by the concept of “social arrhythmia”: the disintegration of daily life, work and career rhythms. Unfortunately, workforce flexibility often determines an accelerated payoff on capital as well as its unrestricted traffic, and has had a detrimental effect on working conditions (Castells, 1996). Although the utilisation of knowledge and skills has intensified, a greater level of autonomy has not as of yet been attained (Zuzevičiūtė & Teresevičienė, 2008). A need for practices that promote social cohesion remains to be addressed, and here the role of teacher can not be underestimated. Therefore, the question that has to be explored is how teachers perceive the changes of educational practice towards fostering social cohesion in education. This study presents some theoretical background and reflection on empirical findings of teachers’ perceptions of educational situations regarding social cohesion in the context of sustainable development.

It seems that our society is living better than at any other moment in history (Castells, 2007); our prosperity is based on technologies that free many from physical work. However, a relatively easier life is very often an illusion. Even wealthy societies have

many people who work hard, though the nature of their work is different, to create a new design, a new car, or write a book, for example. Although, in the case of failing to design a new car or write a book, neither the designer nor the writer are condemned to starvation, as was the case earlier in history, where if you did not sow grain, famine was a real probability. According to Castells (2007), the increasing amount of society's wealth has nothing to do with society becoming wealthier. In many countries, even those whom we consider to be the cradles of equality and equal possibilities, some people become incredibly rich while others either become somewhat richer or their economic situation remains the same, leading to a growing gap in society. The same principle applies for sustainability because, quite often, wealth is primarily based on using natural resources without consideration of the long term consequences (Jämsä, 2006; Government of the Republic of Lithuania, 2003). From the point of view of economic prosperity, the societies of the 21<sup>st</sup> century have progressed less than we might want to believe.

### **Types of subcultures: looking for the connections with sustainability**

Martin and Siehl (1983) have identified at least three types of subcultures, namely Counterculture, Orthogonal subculture and Enhancing subculture.

People, who believe, manifest, and practice values that contradict prevailing culture comprise countersubcultures. There are many of these (Kiškina, 2008; Kiškina, Kavolis, Buivydas, Prancevičiūtė, & Šalūnienė, 2008). Skinheads, Bikers, Punks, Goths, and many other groups consisting predominantly of young people, but sometimes of people of all ages might be considered as such. These groups demonstrate behaviors and appear to have beliefs which the general dominant culture considers delinquent at best and illegal in some cases. Probably the guru's example, who teaches his believers that violence is the way to prove one's point might be latter case. Considering globalisation, the teacher's changing role, and the culture of educational practices as it's focus, it is difficult to provide an example of such a counterculture. With sustainability in mind, the example of such countercultures might be the radical environmentalists, who dissent against atomic power plants, or power plants of any kind for that matter. The early representatives of such countercultures were workers in Great Britain in the 17th century, who damaged and even ruined textile machines. Today, from a historical perspective, we do understand the latter: one machine now does the same work that 6 machines or 12 workers did earlier. That means 5 (or 11) other people were left unemployed and therefore at danger (the age of industrialisation was the age of great loss in life) to die of hunger (Losee, 1993). However, we do not understand, or at least do not support the fighters against nuclear power. Not knowing how to otherwise provide alternative energy for 6 billion people, we feel the protests are futile, unproductive, or both.

Orthogonal subcultures include people who do not contradict the dominant culture, rather, they emphasise specific aspects or certain values that the culture embraces anyway. In case of sustainability, the example of activity of moderate environmentalists could be included in this concept. It does not contradict to a dominant culture to stand for alternative sources of energy, like wind. On the contrary, it is considered a responsible activity, good for the public and even fashionable to encourage states and private organisations to use wind power. However, these people are not fully aware that "ecological" source sometimes can cause substantial damage to nature (Laumer, 2006). If ecologically orientated people encounter this kind of information, they, most probably,

will reconsider some of the slogans, and will search for more information one way or another.

At last, the representatives of the Enhancing subculture act as proponents and sometimes even prophets of the values and beliefs that are generally accepted by the dominant culture anyway. They do not contradict, but rather foster and promote the values and behaviors that manifest certain values. In education towards the social cohesion and sustainability, many teachers trigger and promote discussions about natural resources in order to foster responsible consumerism, equality of distribution, care for each other and responsibility.

With this analysis at hand, we may provide the midterim conclusion that teachers' changing roles related to social cohesion could be connected to changes in culture. It is not still clear whether the depth of these changes is sufficient to support education for sustainable development and social cohesion at a needed level, and how these changes are operationalised in everyday educational practices.

## **Methodology**

The empirical study was designed and implemented as one of the stages of a longitudinal study for the project *Strategies for Inclusion and Social Cohesion in Europe from Education* (Integrated project, VI Framework Programme), coordinated by Barcelona University and carried out by a team of researchers at the Department of Education of Vytautas Magnus University in Lithuania during winter and spring of 2008. The semi-structured interview was designed by an international team, lead by the coordinators at Barcelona University and Malta University, in order to identify the teachers' perceptions of educational activities with a goal to highlight those activities that foster social cohesion as one of the dimensions of education for sustainable development. The interview contained 12 questions such as "What do you do to include students and their families to building up the community in every way possible (the community that takes care of environment, people who can not take care of themselves, etc.)?"

In line with the project proposal, eight primary school teachers (teachers for grades 1-4) from one of Kaunas region basic schools were interviewed. The region and the school were selected as they adhered to the main indicators specified in the study requirements: the school is situated in the community with a wide scope of families with different socio-economic status, from well situated families to those living below the official threshold of poverty. The community includes minority families and several disabled students. The most important thing determining the choice of this school was the higher achievements of pupils compared with the similar schools in other places.

All respondents were women with the age range from 30 to 48 years; their work experience varied from 5 to 23 years. All of them have a higher education, some of them acquired a higher education after several years of professional experience. Data collection was performed with an adherence to main ethical requirements of the methodology of social research and in collaboration with the colleagues in Malta and Spain, especially in the field of research tools. The research was organized in one of the school's classrooms in the spring of 2008. Time and place ensured the possibility for open conversation. Each participant of the study was provided with a written description of the study and if they agreed to participate in a study, they were asked to sign a consent form. All respondents had positive attitude toward the interview process. All interviews were audio-

recorded. For the interpretation of data received through the semi-structured interviews, the method of content analysis was used. First of all, the authors of the study were interested in the detecting the type of subculture represented in the answers of teachers. Then, among others, the following themes were searched for in the textual units of answers: role of the teacher in cooperation with the community, partnership with parents to foster social inclusion, and educational involvement of children from different backgrounds.

### **Perspective of interviewed teachers: ways to reach social cohesion**

Despite acknowledgement of its significance in the last two decades of the 20th century, the concept of sustainable development proved to be difficult to apply in many cases. According to Bonnett, we should conceive sustainability not as a policy but as a frame of mind. It is important to ask: what constitutes a right relationship with nature? And this question relates both to the basic concept of sustainable development, and motives to implement education towards it, and also it is related to an understanding of ideas about human identity, which are implicit in any proper understanding of sustainable development (Bonnett, 2002). Sustainable development means that the needs of the present generation should be met without compromising the ability of future generations to meet their own needs. The main goal of sustainable development is to achieve a satisfactory quality of life now and for coming generations.

One of the dimensions of quality of life is rewarding education in a fostering community; that is the way to operationalise changes in daily educational practice. The analysis of studies in the field of social cohesion and sustainability both in Lithuania and globally reveals that social cohesion still faces a number of challenges, as a number of new forms of social exclusion become evident in Lithuanian society (Jonikova, 2000; Gudynas, 2003). This occurs because Lithuania is joining a market orientated economy, and the global society characterized by heterogeneity that has created some challenges that were not very evident previously, has become very influential in recent years.

As it was mentioned earlier, the representatives of the Enhancing subculture act as the proponents and sometimes even prophets of the values and beliefs that are generally accepted by the dominant culture anyway. Social cohesion and sustainability seem to be accepted values for the dominant democratic culture. However, it is not still completely clear to what extent these values are supported by practice, in our case – participation in school activities and educational practices in general.

Extensive research in the field remains one of the crucial activities to highlight the possible ways for rendering education more sustainability orientated, empowering and enabling more active social participation later in the student's life as an adult. Contemporary reality advances a lot of tasks and creates many problems for schools, families and teachers. These problems can be solved only by common efforts. So, cooperation with the community becomes a very important factor to stress in a teachers' role. This is the first theme discerned from the interviews. As one of the respondents stated:

*School cooperates with community, certain representatives, and organizations within the community a lot... this would be with the library, with a forestry society, and forestry administration authority in our region... we have many events together [...]. We are really community orientated... Friendly, and we feel well within our space... actually, people come to see how we work, how we live, what a beautiful school we have, and what we do here. So yes,*

*we cooperate well within a school, in the immediate community, and way beyond* (Teacher, 11 years of experience).

The next theme prevailing in the answers is the teachers' partnership with parents to foster social inclusion. Teachers welcome any parents' participation in school activities. The data of educational research show that children achieve better learning results in schools where parents are involved in educational process and the behavior of children becomes more socially acceptable (Comer & Haynes, 1992; Steinberg, Mounts, Lamborn, & Dornbusch, 1991, etc.). It is a challenge to attract families belonging to minorities or problem families to school:

*The children who are at risk of social exclusion come mostly from low income families which are often the result of dysfunctional social and economic behaviors, like drinking.... and the parents from such families do not always actively participate in school activities... you know, sometimes children themselves are quite cruel... and yes, you might say sometimes marginalization happens...* (Teacher, 13 years of experience).

The same teacher also emphasizes the role of parents' education for their involvement in school activities. A higher level of education directly correlates with higher involvement:

*And the ones (parents) who have secondary or basic (9 years of schooling) education, they know everything, they do not need anything, they do not come.... the parents' education is very important. Those who have a higher education are more inclined to participate. The more they know, the more often they say that some things are unclear and want to know more* (Teacher, 13 years of experience).

Though, the teachers also mentioned some examples of very successful cooperation:

*I fully agree with the inclusion of parents into teaching. I think that parents could even attend a class. For example, when I was expecting a child, one of the mothers of my pupils was a MD – obstetrician. So I invited her to tell children, how children are born, how things work, and the children were absolutely excited. Of course, there is always a question of ethics – what should be said and when. But in that case everything went so well together – me – pregnant, and that explanation, and mother was very sensitive.... so later, when I had another class, I invited her again* (Teacher, 18 years of experience).

The third important aspect of educational activities toward social cohesion is related to educational involvement of children from different backgrounds. During the interviews the teachers emphasized that we are living in multicultural society, the world is very much internationalized, so one of the goals of education becomes the support for each child in a way that makes him/her feel secure and motivated:

*And all children, of any religion, nationality, or a child with special learning needs – well, they are all included in extra curricular activities, events that are organized beyond the school all the time. Sports, also ecology, whatever is of interest to them. Curriculum is changed according to needs of every child, and this is done by each teacher... and this is a job for a jeweler... everything has to be done in a sensitive way* (Teacher, 13 years of experience).

The participants of the study also mentioned the need for the teachers' skillful empathetic interaction with children of different background:

*We do modify curriculum for a child with special needs, but if the special needs – learning difficulties come from a family that is at risk of social marginalization, if a child is neglected at home? Therefore, the support should be gentle and almost invisible sometimes... I had two girls in my class, one of them did not have mother, and the other one did not have father... I included them in absolutely everything we did in class, in performance, everywhere. I kept telling them: girls, everything will be fine, you'll be princesses... (Teacher, 13 years of experience).*

The quotes from the teachers' answers as well as other interview data show that the school involved in this study (Kaunas region) is inclined to implement a number of educational practices towards social cohesion and sustainability. Though, the study seems to indicate clearly that even if teachers embrace the new role and foster active participation in community and mutual support, often other agents, e.g. parents, still have to be encouraged to participate.

## Conclusions

In the 21st century, living in a postmodern community that experiences rapid social, economical, political and cultural changes, the role of the teacher in the educational process becomes even more important. Teachers today are expected to foster the development of self-determined persons. Teachers should aim toward educating individuals able to act and live in a changing political and economical situation, as well as to participate in creating a democratic society, where social cohesion and sustainability are the main objectives.

Nowadays teachers, as socially active agents, should promote the cooperation among different community groups. The focus should be on the interaction between families and school, and on the communication and cooperation among teachers, pupils, and parents. Parent involvement in school life can be one of the means for creating a cooperative and cohesive society.

The deeper analysis of the project activities revealed that interviewed primary school teachers in the Kaunas region of Lithuania tend to act as representatives of the Enhancing subculture. It is evident that quite often they perform the role of active proponents of sustainability and social cohesion.

This study, completed as one of the activities of the project *Strategies for Inclusion and Social Cohesion in Europe from Education*, indicates that even if teachers have embraced the new role and foster active participation in community activities and mutual support of all engaged stakeholders, it is still necessary to invest in encouraging other agents to participate in a child's education to a greater extent.

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## SHAPING THE MULTILINGUAL LEARNING ENVIRONMENT: THE CASE OF MULTILINGUAL EDUCATION PILOT PROJECT IN GEORGIA

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### Abstract

*The multicultural and multilingual nature of the environment creates a necessity to deal with the diversity and social integration, thus making minority education one of the leading themes almost in any education reform today. Georgia, like many other former Soviet republics, experiences the need for multicultural policies. To test the multilingual education model as a tool to respond to urgent needs of the Georgian society in the spheres of education and societal cohesion, an internationally designed and funded Multilingual Education Pilot Project was implemented during the school years 2006 – 2008 in 12 schools in Georgia. During the Pilot Project, 12 research methods and instruments have been devised and implemented. Conclusions from the data analysis have been drawn, and recommendations for a broader implementation of multilingual education in Georgia have been provided. The overall impact of the Project was evaluated as highly satisfactory. The article aims to reflect on project experience, track observable changes in the educational environment, and analyze the pedagogical factors involved in successful implementation of multilingual education and sustainability of the innovations.*

**Key words:** *multilingual education; teachers; learning environment; lesson observation; sustainable changes.*

### Introduction

In many former Soviet republics language policy and bilingual education have been intensely discussed. After a period of rigid language policies, these republics are gradually becoming aware of the need for multicultural and multilingual policies. Post-soviet countries aspiring to join the European Union (EU), particularly the Baltic states Estonia and Latvia, have been “required” to formulate minority policies in terms of Western values of pluralism, human rights, and tolerance, as well as cultural and linguistic diversity (Silova, 2006). Multilingual and multicultural education have been prescribed as a tool for tackling the problem.

The aim of the paper is to reflect on the pedagogical aspects of multilingual education implementation process in Georgia. The author’s educational background and profes-

sional experience determine that Georgian experience has been analyzed in comparison with the processes in other postsoviet republics – particularly the Baltic States as well as Middle Asia.

Similarly as in Latvia before the Minority Education Reform, the school system in Georgia has continued a tradition of running schools with minority languages as main languages of instruction. According to the Georgia Education Strategy (The Ministry of Education..., 2007), currently there are 423 so-called non-Georgian schools and non-Georgian sectors of instruction (123,745 students). Languages of instruction in these schools and sectors are Russian, Armenian, Azeri and Ossetian. Of these, 273 schools are located in Samtskhe-Javakheti and Kvemo Kartli – two regions densely populated by Armenian and Azeri populations respectively. It is estimated that about thirteen percent of the whole population do not speak the State (Georgian) language. The positive aspect of this system is that linguistic minorities have the opportunity to receive education in their mother tongue, which is crucial for linguistic and psycho-social development of children belonging to ethno-linguistic minority groups. On the other hand, the education system separates children along ethnic and linguistic lines, which does not help the development of a shared understanding of citizenship and feeling of belonging for members of different ethno-linguistic groups. Children end up having different linguistic capacities which, unfortunately, has an important impact on their professional and economic opportunities (Bachman, 2006).

Chapter 36 of Agenda 21 (1992) identifying four major thrusts of education to support a sustainable future has posed the improvement of the access to and quality of basic education as the first priority of education for sustainable development. Tracking student success by race, ethnicity or preferred learning style shows weaknesses within school systems' capabilities to serve youth from the diverse backgrounds.

In Latvia as well as in Georgia the reform of minority education was facilitated by the international organizations and accepted and announced by local policy according to the aims declared by the governing parties. In Latvia to address the minority education issue the Soros Foundation-Latvia (SFL) (1999–2003) launched the project “Open School” (Grigule, Catlaks, Silova, & Maslo, 1999). The goal of the project was to create an educational system that fosters the ethnic integration of society by developing common values and goals, promoting tolerance of diversity, and encouraging cooperation between Latvian and non-Latvian speakers. In Georgia two-year project (2006–2008) for multilingual program piloting was realized by Swiss non-governmental organization Cimera financially supported by the Organization for Security and Co-operation in Europe / High Commissioner on National Minorities (OECE/HCNM). The *Multilingual Education in Georgia* (MLG) project aimed at developing and producing methodological tools and training teachers as to introduce multilingual education in primary schools of two regions in Georgia densely populated by ethno-linguistic minorities.

The study aims to reflect on the project experience, to track observable changes in the learning environment; to analyze the pedagogical factors involved in successful implementation of multilingual education, and to evaluate the necessary support for teachers to ensure sustainability of the innovations.

## Background

The conceptual context of minority education has been based on social transformation theory of Dewey (1916) and Vygotsky (1978) as well as on the theoretical foundations and research on bilingual and intercultural education (Baker, 2001; Cummins, 1996; Banks & McGee Banks, 1997; Batelaan, 2002). The conceptual context of minority education is also formed by the comparative research (Steiner-Khamsi, 2004; Silova, 2006), notions of educational change (Hargreaves, 2003; Fullan, 2005a; Levin, 2008; Sugrue, 2008), education for sustainable development (Clark, 1997; Salite, 2002; Grabovska, 2006; UNESCO, 2005) and EU and other internationally recognized documents and declarations.

The majority of comparative research examining the politics of education transfer focuses on mapping the transfer process by tracing what aspects of “borrowed” education models have been modified, omitted, or accepted as a result of the transfer process. Another research aspect is the differentiation between rhetorical and practical borrowing. Tyack and Cuban (1995) suggest that it is important to distinguish between “policy talk”, which is the current rhetoric in media; “policy action,” which means that programs and innovations are adopted; and “policy implementation,” which relates to what actually happens in the classroom. Silova (2006) summarizes that an examination of the *process* of education borrowing could show that new innovations may exist rhetorically and even be approved on the school level. According to Steiner-Khamsi (2002), this dual transfer process – from policy talk to action and from policy action to implementation – provides ample room for modification, reinterpretation, and resistance by various actors involved at each level of the borrowing process. Change where it counts the most – in the daily interactions of teachers and students – is the hardest to achieve, and to do this requires not only political will and commitment but also an accurate understanding of schools as institutions (Tyack & Cuban, 1995).

Recent research has acknowledged an increased emphasis on capacity-building as central to school and system improvement. Fullan defines capacity building as

*... the development and use of policies, strategies, and actions that increase the collective power of efficacy of whole groups, organizations, or systems to engage in continuous improvement for ongoing student learning. Typically, capacity-building synergizes three powerful collective phenomena:*

- *New skills and dispositions,*
- *More focused and enhanced resources,*
- *Greater shared commitment, cohesion, and motivation* (Fullan, 2005b, p. 213).

Capacity-building, as it is considered by Levin (2008), is something much more extensive than training, it implies a developmental process that changes settings as well as the people working in them.

A further important international development concerns the growing recognition of respect for diversity and of finding new ways to reach minority and immigrant populations (Joshee, 2004).

The legitimacy and value of linguistic diversity is underlined in a growing number of international treaties and other documents that come from the number of sources: the United Nations and its associated agencies, the Council of Europe and the Organization for Security and Cooperation in Europe (OSCE). Particularly, the *United Nations*

*Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities* (UN, 1992), the *Document of the Copenhagen Meeting of the Conference on the Human Dimension of the CSCE* (Conference for Security and Cooperation in Europe, 1990), the *Council of Europe Framework Convention for the Protection of National Minorities* (Council of Europe, 1995) and the *European Charter for Regional or Minority Languages* (Council of Europe, 1992) should be mentioned. The latest of the Commission of the European Communities' documents and activities are aimed at the implementation of concept of multilingualism as an asset for Europe and a shared commitment (Commission of the European Communities, 2008).

The present study draws on several sets of criteria developed by international practice. Cuban (1998) has suggested three common criteria used by policymaking elites (effectiveness, popularity, and fidelity) and two less common ones used by practitioners (adaptability and longevity). The Estonian Language Immersion Centre has provided *Characteristics of Good Immersion Schools* (Language Immersion Centre, 2000), which deal with school climate and school staff. The Center for Research on Education, Diversity and Excellence (2002) has set up standards for effective pedagogy in multilingual settings emphasizing teacher and students joint productive and challenging activities, communication, contextualization, and language development across the curriculum.

Focusing on the classroom and the teachers as change agents, the hypothesis can be put forward that successful implementation and sustainability of innovations in the field of multicultural education can be linked to:

- Applicability and flexibility of the introduced model and project participants' active engagement and shared responsibility;
- Learning environment oriented to active learning, creativity, cooperation, and reflectivity.

### **Implementation and adaptation of MLE models in the project schools**

The introduction of multilingual education (MLE) in Georgia implies (1) the theoretical foundation of the appropriate program, and the practical design of the model for particular school, (2) the training of teachers in interactive methodology and design of the teaching materials, (3) parents' involvement and (4) monitoring and evaluation of the results.

For the implementation of the MLE project, the strong form of bilingual education namely the *Developmental Maintenance and Heritage Language Bilingual Education Program* has been selected, adapted to the reality and possibilities of Georgian education system. The model is generally applied when the language of instruction at school is the native or home language of minority children and the goal is full bilingualism (Baker, 2001). Examples include Catalan in Spain, Ukrainian in Canada, Finnish in Sweden. Schools with Azeri, Armenian, Georgian, and Russian language for instruction were selected to pilot the multilingual education. In three schools, the language of instruction was Russian or Georgian, whereas, the home language of majority of the children was Armenian. This meant that parents of these pupils had already chosen a type of bilingual education, the full immersion model. The implementation of a multilingual education model, by providing lessons in the mother tongue Armenian, in reality softened this "swim or sink" model. The pilot sample included bilingual models with Georgian

language allocation of 17-29% and trilingual models with Georgian language allocation of 15-17% and third language allocation of 2-5%. During the second project year, two schools increased the proportion of lessons conducted in the Georgian language from 19 to 33%.

The main criterion for subject selection was their potential to create a second language environment. Schools were recommended to select subjects where demonstration, visualization, gestures and body language could be used as a communication medium. Art (Handicraft and Drawing), Sports and Natural Sciences were identified as corresponding to this criterion in the best way.

The next important criterion was the teacher's qualification. Practically none of the class teachers had the appropriate level of second language proficiency necessary for teaching. Also hardly any of the subject teachers in minority schools were capable of conducting his/her subject in a second language. Three subject teachers had been found for teaching Natural Science, Sports and Drawing. In other cases the subject teaching was assigned to language teachers. Some schools initiated the model of two teachers' presence in the classroom during the lessons in second language. It had a particularly positive effect in situations where Georgian teachers did not know the pupils' first language.

In this way the models were adapted to the reality and possibilities of Georgian education system and piloted during the school year 2006/2007 in 18 first grade classes. During the school year 2007/2008 MLE had expanded vertically and took place in 17 first grade classes and 18 second grade classes, involving a total of 580 children.

### **Teachers' professional development in the context of sustainability**

Education for sustainable development can be seen as an overall perspective and ongoing process in a changeable world. Attainment of sustainable development and related educational processes will vary from context to context since they can be implemented in many culturally appropriate forms. The project *Multilingual Education in the Georgia* shares the principles and values that underlie quality education and sustainable development: it addresses content, taking into account context, global issues and local priorities; uses a variety of pedagogical techniques that promote participatory learning and higher-order thinking skills; upholds and conveys the ideals of a sustainable world – a world that is just, equitable, and peaceable, in which individuals care for the environment to contribute to intergenerational equity, etc. Multilingual education reform and MLG particularly, required teachers to learn new skills and knowledge, to think about their profession from a different perspective, develop critical thinking and responsibility. In this way we can consider the participation in the project as a driving force.

The start of the project implementation has indicated a very low level of qualification of the teachers working in minority schools in terms of teaching methodology. Regarding the professional profile, only 36% of project teachers from Kvemo Kartli region hold higher pedagogical education certification. The project concept foresaw the need for teachers' initial training and preparation for multilingual education implementation. During the first year of the project, a 64 hours training course consisting of 3 modules (40/16/8 hours) was designed and conducted. During the second school year, project teachers received 24 hours (3 modules) of training and 4 seminars were held for local trainers. The overall aims of the methodological training were: for the first training – to

raise awareness; for the second – to build skills; for the third – to reflect on the experience and plan for the future implementation of multilingual education. In order to monitor how teachers applied the interactive tools acquired during the training and to secure the progress, regular observation of lessons, individual consultations and exchange seminars were taking place in all pilot schools. During the second pilot year the training focused on specific issues: second language literacy development, introduction of pupils' language portfolio as a tool for the language skills' assessment, lesson observation and self-evaluation skills. The project strategy had been based on the involvement of local specialists into the trainings and increased emphasis on capacity building and development of school as a social institution (space for social relations). The "training" and "train the trainer" models that were widely used in the initial project stage were replaced by an approach that relies more on school and regional leadership teams.

## Method

The project evaluation was conducted to measure, analyze and draw some conclusions on the impact of MLE on pupils, teachers and community, parents in particular, and to provide the donor, the MES and other decision makers and stakeholders the information on the effectiveness of the Pilot Project and MLE. During the Pilot Project 12 research methods and instruments had been devised and implemented (Grigule & Perrin, 2008). The development of the pupils' language skills was monitored and evaluated organizing initial individual language skills assessment, The 1st and the 2nd Grade Pupils' Georgian Language Test, and introducing The Pupil's Language Portfolio. The data about parents' opinion on multilingual education and language acquisition, their acceptance of the project, and information on their children experience in the school were received through the survey conducted at the end of the first pilot year (N=222) and informal interviews at the open lessons during the second year.

To study the teachers and school principals' professional development and acceptance of the project, a questionnaire was designed and conducted during the project first phase evaluation seminar in June 2007 (N=38). Overall, on a 5 points scale, the school principals and the teachers gave a positive evaluation of the project and its inputs (4.52 and 4.50 points respectively). For the final evaluation to obtain qualitative, in-depth data four focus group discussions were prepared and organized – one for school principals, one for class teachers and two for subject teachers. The discussions were moderated by local experts, a *rapporteur* took the minutes and discussions were also tape-recorded and a transcript has been done. The discussion was about the results of the project, practices that helped to reach these results, the main constraints and problems identified during the practice and local solutions found for these problems. The school principals were asked to discuss these topics focusing on human resources, cooperation on school level and society/parents involvement. The teachers discussed the methodology, teaching resources, cooperation and working with parents.

One of the main techniques explored for both teacher capacity building and research purposes was classroom observation. During the initial project phase emphasis was put on participant observation. During the second phase the local experts, project regional coordinators and pilot school teachers were introduced to observation purposes, techniques and instruments, and involved in the structured observational data collection (Bowers, 1987). The observations aimed to investigate teacher/pupil interaction patterns,

students' learning activity and language use, and evaluate the conformity of learning environment to the multilingual and cooperative learning criteria. Observation instruments developed during The Open School (*Atvērtā skola*, n.d.) and Latvia Education Pilot Projects (*Izmēģinājuma...*, 2006) were translated, introduced and approved for project purposes. The extracts from the completed questionnaires, group discussions recordings, lesson observation protocols and researcher field notes are presented below. Complying with confidentiality issues, the project schools' identity is divulged by region, teachers are described by subject.

## Results

The overall impact of the *Multilingual Education in Georgia Project* was highly satisfactory. It demonstrated that *Developmental Maintenance and Heritage Language Bilingual Education* program had worked successfully in pilot schools and developed pupils' language skills. Already at the end of the first year, as the assessment showed, the pupils had acquired, both in Georgian and in their mother tongue, sufficient language skills, their understanding and listening skills were better than their counterparts, as well as their learning skills were improved. The project had also familiarized teachers with interactive teaching methods. The second year had shown a change in schools' approach to the project. From a rather reserved attitude, schools had become actors in the field of multilingual education: they were participating financially in the project, school principals were actively engaged in the meetings with parents, and schools were looking for solutions to continue the implementation of MLE on their own (Grigule & Perrin, 2008).

### *Changes in learning environment*

It has to be mentioned that the physical and visual school environment in Georgia's rural and mountain areas was and still is extremely poor. In cold weather pupils sit in the classrooms dressed in overcoats as iron stoves produce no or very little warmth. There are several schools where the walls are decorated with the posters from Soviet times or symbols of an ethnic country. The first changes, forced by the pilot, in some cases brought also some fun:

*The project bought and gave visual aids to schools. During a school visit one principal proudly demonstrated the visual aids that were now all placed on the walls ... even table games! (School visit, Kvemo Kartli, 2006).*

Positive changes in teaching style had been noticed during lesson observation: teachers moved away from a frontal, teacher-centered teaching, to designing tasks and creating learning environment for group work, tried to stimulate dialogue among pupils; they were learning how to conduct the whole lesson in the second language. Instead of translating when pupils had not understood, they had started to use various means to ensure comprehension, in particular, visualization, started to look for and bring to the classroom objects, pictures and books with illustrations as visual aids and even made some themselves. Schools had also started to create pupil-friendly learning environment, by displaying pupils' works, visual materials and providing access to learning aids.

The following observations exemplify the introduction of active learning.

- Meaningful learning versus memorizing mechanically:

*A teacher distributes pencils to pupils and asks them to name the colours. One of the boys says that his pencil is black. The teacher corrects him and says that the pencil is green. The pupil disagrees, repeats once again that his pencil is black and draws some lines on the paper to show that the point is black and only the wooden part of a pencil is coloured green. The teacher agrees and approves that the boy has been right because he has named the colour according to function, i.e., what colour he would get by using the pencil. During the post lesson discussion the teacher as well as observers recognized this situation as a good example of pupils' active learning. It demonstrated that the pupil had understood the meaning of words, he had been thinking actively and his language usage was meaningful. And the pupil felt confident to express his opinion and support it (Samtskhe-Javakheti, 2006).*

- Using visualization, modeling and practical activities versus teacher's verbal information:

*In a science lesson teaching about the organs of sense, a teacher asks pupils to put their hands in a bag, touch and guess the objects (Samtskhe-Javakheti, 2007).*

- Pupils were given choice, possibility to substantiate their choice and share experience with their peers:

*A teacher pins pictures of vessels on the board, every pupil chooses the vessel he/she wants to draw (Samtskhe-Javakheti, 2007).*

- Contents of studies was personalized, connected with pupils' environment and culture:

*While preparing for a traditional Muslim spring festival, pupils couch grain and bring traditional sweets. The teacher updates the information about this festival, asks pupils to draw and comment on the pictures (Kvemo Kartli, 2007).*

- Creative learning, learning by discovering and problem solving were stimulated versus ready-made recipes:

*To familiarize pupils with the concepts: alive and inanimate – a teacher brings a bag with a toy dog in it and asks whether it would be as simple to bring alive dog to the classroom (Samtskhe-Javakheti, 2007).*

- A majority of teachers started using the group work method instead of frontal instruction:

*As for group work, at the beginning (addresses to the colleague) we thought that it would be noisy, something awful, but in fact children know that it is possible to do things quietly, without shouting. If we give some task, usually we divide pupils into groups. There are team and captain of the team. Usually, we take part in this process.*

*Even if somebody lacks something, others help him/her, since they are working in group. If someone lacks something and the other has it, they began working together* (Teachers' group discussion, 2008).

- Relationship between a teacher and a pupil – pupils started treating and perceiving teacher as a friend and a study partner instead of fearing her or seeing her as a controller:

*During the open lesson the teachers-observers noticed that pupils were allowed to address the teacher by her first name* (Open lesson, Kvemo Kartli, 2007).

### *Development of teachers and school principals' perception on the project*

The situation at the beginning of the project indicated to project teachers' diverse educational background and professional skills. Furthermore, teachers had more questions concerning their professional future within the project than the pedagogical aspects of multilingual education. Teachers' feelings of insecurity became evident in parents' reporting of arguments. Most frequently mentioned "arguments" were: the threat that a school could become "georgianised"; the fear that quality of the Armenian language would decline if teaching hours in the mother tongue were reduced; and concerns about second language acquisition in elementary school. Teachers were afraid that reforms in minority education could endanger their employment in future. This feeling of insecurity about the future was expressed by one Armenian history teacher regarding the Education Law that anticipates that history should be taught in Georgian by 2011:

*I would be left jobless while some - shvili would teach history in Georgian!  
But me, what would happen to me? How could I support my family?*

The perception that the language for teachers is, first of all, the symbol of identity not a means of communication can be characterized by this situation:

*After the workshop that was conducted by international experts (there was an agreement that the working language will be Russian) half of feedback questionnaires had been filled out in Armenian* (Samtskhe-Javakheti, 2006).

As teachers received more and more information and training on multilingual education methodology and experienced it in the class, they started to give up myths and stereotypes, and their understanding and acceptance of the project increased. In the final conference on the question, what would you recommend to schools which decide to implement the program of multilingual education, 38 out of 39 participants evaluated the project positively and recommended to others to join the process of the multilingual education. In addition, 11 participants directly expressed willingness to share the acquired experience and provided practical suggestions on the most important aspects.

At the beginning of the pilot project, teachers had very limited reflective skills, and were not ready to analyze and evaluate their work openly, to identify their difficulties and training needs. Asked during meetings and trainings about their needs for further support, most common answer was "additional teaching materials". During the second training teachers were asked to reflect on project experience. Few responses were given

to the item: *I still find difficult....* and even in those responses teachers evaluated their pupils' learning instead of analyzing their own teaching process. International consultants reported:

*The participants – teachers demonstrate teaching skills that are seemingly determined by their culture: orientation to reproductive activities and authoritative initiatives, shortcomings of economical thinking about the use of educational materials, etc. (Grigule & Perrin, 2007).*

During the first project year, it was a challenge for the observer to convince teachers not to demonstrate pupils' achievements, but to conduct a regular lesson, in order to see the real teaching/learning process and analyze the planning and performance of lessons. During the second project year, teachers got used to lesson observation and started to consider the observer as a partner rather than an inspector and in presence of observer conducted ordinary lessons. However, during the testing at the end of each school year it was observed that the paradigm shift had not taken place completely and in challenging situations the teacher-centered approach was prevailing:

*The class teacher, asked why she had been pointing at the correct answers to pupils during the test, answered that she was sorry for children (Kvemo Kartli, 2008).*

Final testing of pupils' language skills at the end of the first and unfortunately also second year showed that pupils had a very slight experience and little skills of working independently. It could be observed in the following situation:

*During the test the pupils were choosing the answer, but they were not circling it waiting for the teacher to check and confirm it. In several observed situations teachers wanting the pupils to work and make decisions independently answered they did not know the right answer. In one class the teacher, recognizing her own absurd answer to the pupil started to laugh, hugged the girl who also smiled at her knowingly: how could not her beloved teacher know this (Samtskhe-Javakheti, 2008).*

Individual consultations and training had also identified the initial problems of cooperation between the teachers due to a lack of cooperative skills and experience. In a situation when teachers of the Georgian language had to start teaching subject content it was natural for a class teacher to be the first adviser. Mutual cooperation for teachers was something new:

*In one of the schools art lessons were conducted in Armenian, Georgian and Russian languages. Answering the question how the teachers coordinated the subject content, a teacher of Georgian said that she looked into pupils' notebooks and saw what had been done in the native language and then adapted herself. A teacher of Russian answered with a question "Is it really necessary?" She would rather plan the content together with a subject teacher from the neighboring town (Samtskhe-Javakheti, 2006).*

Evaluating the project, teachers and principals acknowledged the importance of the teachers' cooperation and reported on creative solutions they had found during the project:

*They (Georgian language teachers) have been working already for the second year and they work together with the class teacher – this is a keystone of success (Teachers' group discussion, 2008).*

*I teach Georgian and Handicraft. During Handicraft we prepare materials for the language lesson. Children bring plasticine figures from home and then we learn words using these figures (Teachers' group discussion, 2008).*

During the pilot new relationships had emerged between teachers and parents, who became interested in multilingual program. Parents used to come to the lessons and became involved in learning; teachers told stories how parents had started to learn language together with their children:

*Children use new words at home and parents ask them to repeat in order to learn these new words. Parents come to me telling that they have learnt these words, too (Shvilisi School, 2006).*

*Parents have asked teacher to write a Georgian poem in Cyrillic to understand it better in order to be able to help their children (Samtskhe-Javakheti, 2006).*

At the end of the pilot in March 2008, the participants gave a positive evaluation of the project's input to their professional development. During the discussion teachers described how teaching and learning process in classes had changed using the new methodology:

*This program has given a lot both to my pupils and me. Pupils like lessons delivered by us. They, so to say, slept during the lessons and now they are more cheerful, more active. Now we pay more attention to game elements. Children remember things better, when playing; they remember new words better and memorize them longer (Teachers' questionnaire, 2007).*

*Our communication with children has improved. They are pleased, they like it and it is easier to work with them (Teachers' questionnaire, 2007).*

*Children from bilingual classes are more self-confident (Teachers' questionnaire, 2007).*

The positive results of the project may be attributed to an impact on the civic integration process in Georgia. Knowing about the ethnic conflict between Armenia and Azerbaijan, also international organizations take it into consideration when organizing the projects in Georgia separately for each nationality, for example, in Cimera project at the beginning it was planned to publish two versions of the Game Book – separately for Azeri and Armenian teachers. After consulting with the Ministry of Education the project decided to publish one version of the book (*We are Learning by Playing. 111 Games for Multilingual Education*, 2006) with all four languages included (Georgian-Azeri-Armenian-Russian) considering its symbolic value of fostering equality and peaceful co-existence among languages in Georgia. Disregarding the warnings that Azeri and Armenian teachers would not sit at one table, the seminars in project final stage had been organized for all together in geographically most convenient place. For the majority of participants it was their first experience that they could work together and share in a positive environment. An international expert from Finland, Ekaterina Protassova reported (Grigule & Perrin, 2007):

*When people meet together to learn something new and from examples provided by other people and countries, they start to cooperate. One of the greatest successes of the project was the contacts created between representatives of the Azeri and Armenian ethnic groups.*

## Conclusions

Based on lesson observation, teachers' surveys, school principals, parents, and experts' reports, there were observed changes in learning environment oriented towards active learning, creativity, cooperation, and reflectivity. Teachers and school principals' description of the project benefits could be summarized as follows:

- Understanding and acceptance of the multilingual education methodology by teachers and local community;
- Invention of pupils' friendly learning environment;
- The growth of education quality and wherewith school's authority;
- The development of teachers' professional competencies;
- Higher self-esteem, self-awareness, and civic consciousness for teachers;
- Development of teachers' cooperation and networking;
- Increase of parents' interest in school activities and Georgian language acquisition.

One of the main objectives of the project was, together with the local agencies, to develop possible strategies for a broader implementation of MLE in Georgia. It means, firstly, institutionalization of the pilot initiatives and results and, secondly, development of relevant policies that would ensure their wider dissemination and implementation. Early in the year 2008, the Ministry of Education and Science has made an important steps towards the development of the language policy and strategy, working on the national minority education policy (The Ministry of Education..., 2008), thereby acknowledging the state intentions and providing the legal basis and conceptual framework for multilingual education. Unfortunately the political *force majeure* has blocked the progress of the plans and the intended introduction of multilingual education on the state level in school year 2008 – 2009. Despite the above there is reliable information that a part of the project schools are continuing the MLE on their own. From one side it could be evaluated as a positive evidence of the project impact to sustainable education, on the other hand the international organizations and international education community should be in the position of responsibility. In the current situation schools need to be supported to sustain and not to give up with the started process of transformation and so that there would not be discreditation of the integration polices in the eyes of community.

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## NON-FORMAL ENERGY EDUCATION IN THE CONTEXT OF SUSTAINABILITY: PERSPECTIVE OF LATVIAN EDUCATORS

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### Abstract

*Energy as one of the main concepts of sustainable development currently challenges the society in general and education in particular. The paper reflects on study that is a part of EU COMENIUS project. It explores the situation in Latvia with energy topic in non-formal education in the context of education for sustainable development. The teachers and out-of-school experts' views on non-formal energy education are identified using the constructed tools in relation to: 1) teaching materials; 2) readiness to teach energy education, and 3) out-of-school places for this topic. Structured interview and survey were conducted with 20 experts of out-of-school places and 50 teachers. Both qualitative and quantitative data analysis methods were applied. Different conceptual approaches, the best practice examples, challenges and needs, and the main chances for improvement and development in the field were inferred from the data. The recommendations could be useful both locally and globally for education policymakers, teacher training institutions, administrators for improving connections between formal and non-formal education, pre-service, and in-service teacher training.*

**Key words:** *energy; energy education; teachers; non-formal education; sustainable development.*

Changes, interaction, globalisation, and sustainable development are the key words that characterize processes in contemporary society. Energy is central to sustainable development (SD) and poverty reduction efforts. It affects all aspects of development – social, economic, and environmental – including livelihoods, access to water, agricultural productivity, health, and population levels (UN, 1992a). Globalisation offers many new opportunities but creates also new and often unexpected challenges and problems. The most urgent problem considered from a global perspective is global warming. The global scientific community “is more than 95% certain that climate change is occurring, and that most of the temperature increases over the past fifty years result from human greenhouse emissions, specially carbon dioxide from burning fossil fuels” (Brunsell, Jones, Jackson, & Feddema, 2008, p. 4). Another cause for this problem is fast economical

development and rapid growth of energy use in households. This complex challenge of energy and sustainable development was highlighted at the United Nations Conference on Environment and Development, held in Rio de Janeiro (UN, 1992b).

In the context of climate protection, humanity must diminish usage of energy per each inhabitant or utilize energy resources and materials maximally friendly for environment. The World Summit on Sustainable Development (Heinrich Boell Foundation, 2002) urged people to accelerate the development, dissemination and deployment of affordable and cleaner energy efficiency and energy conservation technologies. Energy effectiveness in domestic usage and economy is not only challenging but also necessary for all society and education (UNESCO, 2004). The subject of environmentally friendly energy covers social as well as scientific competences and focuses on the threat of the climate change. The main aspect for global and local problem solving regarding energy use and climate protection is education of individuals and entire society. It can be implemented as both formal and non-formal education at school and out-of-school education places (OSEP). The new challenge in this area is to integrate the high effectiveness of learning at OSEP into school education. In this article, the efficient usage of energy and renewable energies will serve as the subject to analyse the potentials, needs of teacher education and to create advanced training courses for teachers.

On the global scale, various organizations, e.g., NIOST (2007), NREL (2008), CREATE (2008), etc., are working in the field of non-formal education and energy education. Some of them have conducted a series of projects (NEED, 2007; RnE<sup>2</sup>EW, n.d., etc.), researches, developed standards, programs, and training. Education staff conducts educational outreach events, hands-on activities, and professional development seminars at schools, conventions, competitions, trade shows, fairs and other exhibitions for students, teachers, and consumers.

### **Energy education in formal and non-formal context: situation in Latvia**

Non-formal education has just recently started to develop in Latvia (Kravale, 2006). Ministries and councils are currently elaborating and specifying the conception of non-formal education, its structure and forms of procedure. In Latvia, non-formal education is implemented by diverse institutions and individuals, and higher education institutions. Non-formal education here is often referred to the education of interests, thus reducing the possibilities of the development of non-formal education. The areas of interest education are dancing, music, sports, technical design, theatre, art, and environmental education. Only few examples are known to be related to energy and climate protection activities in non-formal education of Latvia. Therefore this research focuses on the energy topic in school curricula in general and possibilities of integration of formal and non-formal education while teaching this topic.

Analysis of the national regulations for formal education in the field of energy education shows that the situation here is much better. In the National Standards for *Basics of Technology and Science* (including Mathematics, Nature Studies, Physics, Chemistry, Biology, Geography, IT), main tasks for primary school are to provide opportunities to acquire the basic knowledge about rules of mathematics and natural sciences, usage of IT, to foster understanding of the wholeness of nature. This field is oriented to develop the basic research skills by observing nature, using mathematical

models and IT. The tasks that are especially important for this field are to develop understanding about the connection between achievements in mathematics and science, technology, human daily life, economic activities and environment, to create a need to care for the environmental conservation and health, as well as to develop the diverse learning experience (CM, 2006, p.6). Evaluated from the perspective of the energy topic, Standards of Nature Studies for grades 1-6 contain the following items:

- Students recognize the energy sources, can discern renewable and non-renewable sources of energy and display a positive attitude and practical behaviour toward the efficient consumption of energy and natural resources, they display awareness about the changes in nature created by human economic activities;
- Students know the most important advancements in Science and discoveries in the field of environment protection, they understand the implications of Science and technology for the improvement of human conditions and the impact of their inappropriate use on human health and environment, they participate in activities related to the improvement of environmental quality and solution of local problems.

Also, some subjects in the field of *Basics of Technology and Science* (Physics, Chemistry, Geography, Household and Technologies) (grades 8-9) include some themes and learning objectives that are closely related to energy topic.

In 2005-2008, Ministry of Education and Science of Latvia accomplished the EU/ESF Latvian National Program *Development and Improvement of Subject Curricula in Natural Science, Technology, and Mathematics in Secondary Education* Project *Curriculum Development and In-Service Teacher Training in Science, Mathematics, and Technology*. The project aimed to update the curriculum and to improve the quality of teaching and learning in Science (Physics, Chemistry, Biology, and Nature Studies) and Mathematics for secondary school. Current *Regulations on the National Standards in Secondary Education* and *Standards in Secondary Education School Subjects* (CM, 2008) also set task to improve students' understanding about sustainable development and its relationships with environmental, economic, and social processes.

Latvian NGOs working in environmental, energy and social field have set up several local projects on energy efficiency. These NGOs are very motivated to spread the message. The motivation and positive attitude of Latvian NGOs towards energy efficiency is illustrated by their large response to a tender for energy efficiency projects. Six projects were awarded funding and are being implemented. The NGOs play an important role in the awareness raising activities and this stimulates the recognition of these organisations in Latvian society.

Some practical examples of non-formal energy education:

- International Project *Energy is our Future* is intended to enhance and to support energy education across the curriculum in schools. It helps teachers raise their students' awareness on how to save energy, what energy consumption means, and the importance of renewable energy. The project also aims to inspire students to influence behaviours in their nearest environment, such as families and local communities. This project is designed for teachers of sciences, languages, arts, social sciences and ICT in lower and upper secondary school classes.

- LATVENERGO is a state-owned energy utility whose core business is generation and sale of electricity and thermal energy. It is one of environmentally friendly energy companies in Europe. It ensures introduction of modern technologies in economy, social life, and organizes competitions for students. LATVENERGO has created a range of educational materials – computer games, electric safety issues book “Know Electricity”, some movie series “Long Live Children”, posters, etc.

The Latvian national TV program *Vides fakti* [Environmental facts] presents a topic on energy efficiency, e.g. house ventilation and windows, structure of energy tariffs, project financing issues, EU energy efficiency, etc. In total, 16 items have been broadcasted and reached a large audience. The form and presentation of the video clips are specifically adapted to people aged 25 – 35. The clips will be used to make a film on energy efficiency for the distribution in all schools in Latvia.

### Investigation of non-formal energy education in Latvia

The empiric study presented in this paper was conducted as a part of EU COMENIUS Lifelong Learning Program, multilateral project *Inspire School Education by Non-Formal Learning*, in the spring of 2008. Latvia, Germany, and Poland participate in this project as international partners. The main objective of the project is to create synergies and links between OSEP and curricular learning, thus improving the base of knowledge of European pupils. First outcome of the project would be an overview about existing concepts of combining learning at out-of-school places with formal learning at school in the participating countries, focused on the subject of environmentally friendly use of energy. This project therefore aims to provide additional offers for teachers at OSEP, which can be integrated into didactic concepts of school education. Thus, new places for in-service training of teachers in addition to traditional ones will emerge. They will be more intensively adapted to the needs and demands of school education in the context of SD. In order to improve the quality, attractiveness and accessibility of lifelong learning and in-service teacher training, an investigation of existing situation is necessary. The presented study focuses solely on the Latvian situation and is aimed toward the identification of Latvian teachers and other educators' views regarding the non-formal energy education in the context of sustainability. The study will explore teachers and experts' perception about the possibilities of teaching/learning about energy at OSEP in Latvia. The main aspects of the study will be related to teaching materials, teacher training, their readiness for energy education, and possibilities of OSEP for energy education.

### Sample

For the purpose of research, two different samples were collected: a sample of out-of-school education experts was chosen for interview, while a sample of teachers was selected for the survey.

The interview sample of experts (N=20) consisted of 5 males and 15 females and represented teacher training institutions (n=5), out-of-school education places (n=7) and different schools (n=8) from all regions of Latvia. The specialities of experts were

natural sciences (n=15), social sciences (n=3), engineering (n=1), and agronomy (n=1). The work experience of teacher educators in the average was over 31 year. The teachers' pedagogical experience was in the average 28 years. Three teachers were doctoral students. The pedagogical experience of OSEP experts was in the average 11 years. The majority of the experts had some experience of administrative work.

The teachers (N=50) involved in the survey (6% male, 94% female) represented different types of schools: primary schools (12%), basic schools (20%), secondary schools (58%), and other schools (10%) from all regions of Latvia. Their pedagogical experience was 1-40 years (in average 18 years). Approximately half of the sample were teachers of natural science; the other half were specialised in other disciplines.

Therefore, structure and qualitative features of the samples for survey and interview confirm their validity for the presented research.

### *Methods, procedure and data analysis*

#### *Interview*

The aim of interview was to: 1) reveal the real situation concerning the integration of OSEP and school curricula in relation to energy education; 2) to discover the impact of out-of-school places on students' learning, especially on social competences, knowledge in Science, and knowledge on environment. Structured interview with 14 questions was created by INSPIRE project team from Latvia. In this research the answers for seven interview questions targeting solely the energy education were analysed. The interview contained questions like "*What kind of teaching materials (regarding content, structure, etc.) dealing with the topic of energy in out-of-school places you would be happy to use as a teacher?*" and "*What eventual challenges and concerns do you see regarding the integration of school and out-of-school places specifically for the acquisition of energy related topics?*"

While arranging the interview, the time, place, and length of interview were coordinated (up to 60 minutes). Permission was asked for audio recording of the interview. The level of confidentiality of interview data was decided (the results of interview mainly appear in summarised form; in need of quoting, the respondents are depicted in the project reports only in coded form, etc.). The respondents were briefly familiarized with the project and its research topic and informed about the aim of the interview. Before the interviews, the demographic data were collected from the participants. All the interviews were audio-taped and transcribed to create a written protocol.

Since the interview questions were focused on few specific topics, the interview data analysis was simple enough to allow the creation of sub-themes, as guided by research aim and topics. Similar individual themes were clustered and appropriate language to describe them was selected. The interview data later was triangulated with the data from teachers' survey.

#### *Survey*

The survey conducted within the study was applied to obtain both quantitative and qualitative information from the teachers that could be used as the data complementing and adding some specificity to the main data obtained from the interviews with experts.

A structured 18-item survey with open-ended and closed questions was created by the INSPIRE project team from Latvia. In this study, the researchers analyzed only the last four questions of the survey related to energy topic in non-formal education. The example of survey questions: “*Name extracurricular places in your town (district) where your pupils could master the topics about energy?*”

Respondents gave their consent for confidentiality and anonymity of their answers before the survey. The answers on the survey questions were collected both in hard-paper and electronic form. The respondents were briefly introduced to the research topic and informed about the aim of the survey. The survey started with information about the demographic data of respondents. Both qualitative and quantitative data analysis methods were applied.

## Results

The experts' answers on interview questions and the teachers' answers on survey questions were analyzed in consideration of three aspects: 1) curriculum and teaching materials on energy education; 2) teacher training for energy education; and 3) OSEP and its staff for energy education. Though, the answers for several questions differed for two sample groups, the more detailed analysis of these differences and their reasons would become the aim of further studies. Because of the limited space, the results of two research instruments are presented mainly in a form of aggregated summary, using just a few quantitative indices to illustrate the most impressive findings or if it was impossible to avoid the usage of numbers.

### *Curriculum and teaching materials on energy education*

The experts admitted that in Latvia energy topic is formally included in the present day educational curriculum for all stages of education. However, the implementation of this topic creates a challenge because of axiological issues, improper approach to the subject, limitation to only some disciplines. New secondary school programs for Nature Studies, Physics, Biology, and Chemistry provide a closer attention to improvement of students' understanding about sustainable development and the relationships of its environmental, economic and social aspects, also concerning the energy use.

Answering the question about the teaching materials (regarding content, structure, etc.) on the topic of energy in OSEP, the majority of experts recognized that there are enough materials for environmental education in both printed and in electronic form. However, they indicated to the lack of proper materials for energy topic. Only two items were mentioned regarding the energy topic – materials of LATVENERGO and brochure with DVD on the types of alternative energy in Latvia (see: [http://www.latvenergo.lv/portal/page?\\_pageid=73,56674&\\_dad=portal&\\_schema=PORTAL](http://www.latvenergo.lv/portal/page?_pageid=73,56674&_dad=portal&_schema=PORTAL)). Surprisingly, the teachers mentioned longer list of materials. One teacher wrote that topics of energy are included in Nature Studies, Physics, Chemistry, and Geography textbooks for formal education.

It is generally accepted that these materials can be used for both formal and non-formal education. While teacher trainers admitted that there are lot of teaching materials and criticised their quality, teachers and OSEP staff expressed the wish to have more materials. They also named different materials such as:

- Journal *Vides Vēstis* [Environmental messenger] published by the Friends of the Earth Latvia (see: <http://www.videsvestis.lv/default.asp?english>);
- journal *TERRA* published by the University of Latvia (see: <http://www.lu.lv/terra/>);
- professional journal *Enerģētika un automatizācija* [Power industry and automation] (see: <http://www.baltenergy.com/>);
- Internet resources: <http://www.futurenergia.org/ww/en/pub/futurenergia/about/about.htm>; <http://www.zalajosta.lv/>; <http://www.zalais.lv/en/>; <http://www.windenergy.lv/en/projekti.html>; <http://www.liis.lv/vi/vienerg.htm>; etc.

Teachers wanted more updated technological approach to such materials and expressed rather detailed view on the content and pedagogy of such materials.

### *Teacher training for energy education*

The analysis of answers on the question about the readiness of teachers to organize the cognition of real life topics and development of skills for reasonable behaviour for their students (for instance, the cognition of different topics on energy) show that they are not quite unanimous. While teachers were more optimistic, teacher educators and OSEP experts did not see the situation as positively as teachers did. Teachers suggested many ideas how to improve this situation: in order to organize learning of energy topic, teachers themselves need to have a strong scientific background, OSEP staff needs proper equipment and time, teachers have to prepare themselves for this topic by visiting OSEP connected with energy education. Those experts who said that teachers were not ready for energy education suggested:

- To raise the individual importance of such topics for teachers, increase the number of students enrolled in Science teacher programs;
- To organize teacher pre-service and in-service training (also in a non-formal way);
- To publish brochures, organize the visits to firms, OSEP;
- To systematize and to plan materials for the whole school year, creating the plan of topics for school subject, tasks that could be used as the training for behavioural models in different situations of life;
- To organize extra courses for students on energy topic with final tests and certificates.

### *Out-of-school learning places for energy education*

When asked to mention OSEP that offer an opportunity for students to get an experience in understanding of real life urgencies, teachers were able to mention the large number of out-of-school places. The universities would probably be able to provide more scientific information about the topic. Except just a few of them, none are educational centres established specially for energy topic. Some administrative problems could be forecasted concerning visits to several of mentioned places since they usually do not consider education as one of their functions. The most frequently mentioned places were: LATVENERGO, hydroelectric power stations (HEPS) on small rivers, thermoelectric power stations, Faculties of Science.

Speaking about the eventual challenges and concerns in relation to the integration of school and OSEP specifically for the acquisition of energy related topics, the respondents admitted that Latvia does not have special OSEP places or organizations, which would support students for learning of energy topic. Other places connected with energy have many problems and they should understand the situation at school better. Experts concluded that some solutions were suggested for the improvement of situation: to motivate and to train teachers, to develop cooperation (e.g., cooperation between schools and HEPS or other enterprises to help students in their research work), to find time for teaching/learning out-of-school, to develop teaching materials, and to organize in-service training courses.

Out of 121 topics mentioned as carried out in out-of-school places by 50 teachers, only 5 topics were connected with energy. However, the positive fact is that of 17 topics that created the most noticeable changes in pupils, 13 topics were connected with nature and environmental protection. Theme “Environmental research and monitoring” received the second rank among 11 topics. This result is a rather good sign considering that the teachers surveyed teach social sciences and humanities twice as often as Science subjects.

The participants were not too willing to offer some new activities for the students as to reach a more comprehensive understanding of energy topic and development of skills for reasonable behaviour, beyond those that were already mentioned. Teacher training institutions showed larger interest in energy topic since they have all the necessary equipment and materials, such as solar cells or batteries, equipment for creating simple wind generator or dynamo machine. HEPS staff is also willing to cooperate and use its potential for students learning and research.

The lists of places teachers have already visited and places they would suggest to visit do not differ much. The only educational organizations in this list were Daugavpils University and Riga Children Nature Studies School. It can be concluded that in Latvia there is a scarcity of OSEP where students could master the topic of energy.

## **Conclusions**

Some countries do not have yet stable traditions in integration of formal and non-formal learning. Latvia is still searching for its functions, roles, approaches, and methods. On the global scale, non-formal education and energy education are considered as important components of education for sustainable development. The significance of these trends is connected with the current state of the world in terms of economic, ecologic, social and even political issues. Non-formal education as one of the aspects of education has recently been reflected in many forms: articles, books, Internet resources, etc. However, the energy education as a more specific feature has received coverage on a smaller scale. Though, more practical implication of such education (projects, training opportunities, etc.) is noticeable in a world, the research articles and monographs are still needed here. The energy topic (among the other topics on environmental education and education for sustainable development) is included in educational guidelines, though only a few out-of-school education places carry out energy education in Latvia. Very few teaching units about energy topic are designed yet.

It is evident that ever changing education in Latvia still needs the legislation, curricula and standards that would serve more visionary, anticipatory and future-oriented functions than they carry out today. Energy topic is included in educational guidelines side by side with other important topics connected with environmental education and education for sustainable development. Since the educational legislation in Latvia does not mention education for sustainable development as the central item explicitly, this is still the further aim of advocates, politicians, researchers and practitioners. Actually, only a few OSEP in Latvia could be mentioned that carry out educational functions regarding energy topic. These places mostly do not have yet the elaborated teaching units about energy topic. Also activities on energy topic are not used on regular basis and as the research shows, such a topic is not among the most popular for teachers.

The main chances for improvement and development in this field focus more on teacher training for: 1) the integration of formal/non-formal learning; 2) cooperation with out-of-school places; 3) the updated secondary curriculum in Science and Mathematics that would connect the learning with the life issues and accustom teachers and students to more research and experience-oriented learning.

Since the non-formal learning in OSEP is underdeveloped as a national system in Latvia, the major challenges should be approached systematically:

- **At the state level:** development of legislation and systemic approach to the issue as well as more research are needed. Revision of curriculum, elimination of over-centralization, sustainable financing, and creation of more out-of-school places are the main questions.
- **At the level of teachers:** relevant pre-service/in-service training is the main problem, teachers need to revive their motivation and to find extra time. Besides, focused teaching materials and aids and cooperation with out-of-school places are prerequisites for the further development.
- **At the level of students:** motivation, responsibility, self-discipline, and time are the keywords.
- **At the extracurricular education level:** equipment, training for educational personal, teaching materials, motivation, coordination of offer with students' needs, interests, and curriculum, leadership, self-advertisement, cooperation with schools, and time can be perceived as the challenge.
- **At the community level:** interest and motivation of parents as well as the family traditions need to be developed as to include the visits to out-of-school places related to natural sciences and environmental education.

As can be seen from the description, the common challenges and needs are associated mainly with the financial means, problems at the teachers' level involve a need for cooperation between/inside the school and OSEP.

The project is still under its way and hopefully at least some challenges can turn into promising undertakings regarding the non-formal energy education in Latvia. Energy is our future and we all need some inspiration to ensure its sustainability and security.

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## PRESCHOOL AND PRIMARY SCHOOL CHILDREN AS LEARNERS IN 2030: VIEWS OF FINNISH STUDENT TEACHERS

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### Abstract

*Teachers are key to the future. Because of enormous future changes, teachers need to re-evaluate their thinking. This study focuses on what student teachers think of the future in preschool and primary school of the year 2030. The questionnaire, conducted in October 2007, reached 76 student teachers from the University of Helsinki in Finland. Of these students, 52 were preschool and 24 primary school student teachers. The research questions were: 1) How important is it that children in preschool and primary school in the year 2030 can use language and communication and can work in groups and in the environment? (2) How can preschool and primary school teachers support language learning and communication in the year 2030? (3) How will children in preschool and primary school in the year 2030 take responsibility for their own (child-centred) learning? The results confirm that preschool and primary school student teachers think very traditionally. Many felt that it would be less important for children in 2030 to speak many languages, and student teachers did not consider the use of computers.*

*Key words: future education; preschool education; primary education; student teacher, language learning; multimedia.*

Although Finnish students have good results in the reading, mathematics and natural sciences tests of PISA (Väljörvi et al., 2002) we must remember that we can do even better. The years before the school and first years of school largely determine a child's future. For this reason, teachers are key to the future of children and whole society. Ojala, Siekkinen, and Wright (1996) argue that there is a need for evolution of a new pedagogy. In this vein, we should estimate teachers' existing pedagogical skills and values when we study and plan for the future. In this research student teachers describe their own conceptions of what kind of education will exist in the preschool and primary school in a future.

## Importance of curriculum and specific features of preschool in Finland

In Finnish society, the foundations of education rest on the ideas of welfare, general human rights, equality, social development; the individual abilities and aptitudes are stressed. Education has grown in importance with the development of children's day care. Consequently, early education is high on the social and political agenda. The aim of this education is to develop abilities and to provide tools already for very young ones that they will need in their further life. In recent decades, early education has been considered a part of the system of education and of lifelong learning. There is also a tendency to tie early education more closely to the needs of commerce and industry as well as those of techno-economic development (Niikko, 2004). In Finland preschool is understood as early childhood education for six-year-olds. Preschool is a part of early childhood education. Compulsory education, or primary school, begins at age seven.

According to Finnish researchers Hujala (2002) and Korkeamäki (2006), a curriculum is the most important document for teaching, for it constructs teachers and policy-makers' thinking about children, growth, learning and makes pedagogy visible and understandable to others. The curriculum is a document shared between teachers, parents, children, and, according to recent analysis, the society as a whole. All of these groups should consider the process of curriculum development, implementation and assessment, and recognise that learning must be integrated into children's reality, their everyday lives and the society in which they live. An understanding of the nature of the curriculum is necessary because the policy in Finland is that teachers in the field are professionals capable of making judgments and of interpreting and applying the Finnish National Curriculum, the Core Curriculum for Preschool Education (2000), and the Curriculum for Basic Education (2004) in their own schools and at the classroom level. It is the responsibility of teachers to integrate school subjects into cohesive themes, which cannot be a mere collection of activities.

Therefore, in the preschool, the basis for action is the curriculum. The National Board of Education at the preschool level states in the curriculum (Core Curriculum for Preschool Education in Finland, 2000) that preschool education shall create a foundation for acquiring skills. Children will master basic skills, knowledge and capabilities from different areas according to their age and abilities. Learning through play is essential. Pupils will learn to understand the significance of the peer group in learning. Learning will occur through interaction between the learning material, previously formed knowledge structures and thinking. In interactive peer group situations, children will learn together with and from each other by providing the impetus for the development of thinking and imagination of each group member (*ibid.*).

The curriculum also stipulates that the beginnings of literacy are determined by following actions: children hear and listen, they are heard, are spoken to, people discuss issues with them, and they have to ask questions and receive answers. In such an environment, children will normally develop their vocabulary and literacy. The curriculum also emphasises the planning of a stimulating environment. A stimulating environment will cultivate children's curiosity, interest and motivation to learn, and promote their activity and self-direction. It will support children's diverse growth and learning as well as assessment of their own activities. The stimulating environment will also provide children with opportunities for play, other activities, and peace and quiet. It will also constitute a stimulating linguistic environment and enable the provision of activities to support children's linguistic development (Core Curriculum for Preschool Education in

Finland, 2000). Many teachers believe the responsibility to teach reading rests with first grade teachers (Core Curriculum for Basic Education, 2004).

Finnish preschool educators also highly value objectives of environmental education. The environment and natural history, which also includes sustainable development, were the most valued objectives after “general objectives” in the research conducted at Helsinki preschools in 2001. Sustainable development within this context means that the children learn to care for their environment and to behave responsibly. There were 554 preschool teachers in the Helsinki area and 411 teachers participated in the survey constructed to evaluate different preschool objectives. The third most valued area of the preschool curriculum was language (Reunamo & Nurmilaakso, 2006). Also, Hujala (2002) suggests that Finnish people value environmental issues, diversity and languages to be important components of the curriculum at all stages. The topics of early learning (e.g., communication and language), on which Finnish teachers agree, are important in both preschool and primary school programmes.

Although teachers agree that the topics of learning should be the same in both preschool programmes and the first grade of primary school, they implement them differently. In primary schools, the learning demands are targeted at children. In pre-primary programmes, however, the objectives of different topics are set not for the children, but for the teachers as they plan their work to support children’s activities in their zone of proximal development (Vygotsky, 1978).

Ojala (2004) emphasises that preschool teachers can support children’s learning processes through play and imaginative activities, such as drama, fairy tales and stories. Learning should be organised so that children can learn in everyday situations and teaching should take place together with play, because children at play use their existing experience, which develops as they become better acquainted with themselves and their surrounding environment.

## **Teacher education in Finland**

What will be new roles and responsibilities of teachers in the future? In the 1990’s the chief beneficiaries were non-traditional students or those with limited access to regular study programs. One could argue that in the future, all students should benefit from new technologies. Technology uses a form of literacy that is becoming essential for success in the workplace and in the word. Those who have mastered its use will have a lifelong advantage over those have not (Chen & Chang, 2006).

According to Yoon (2006), student teachers indicate that the goals of teacher education programmes should be to nurture belief systems, ways of teaching, vision, good personality and subject matter knowledge, thereby meeting the demands of society. They imply that educational programmes should provide experience of personality education, progressive ways of thinking, teacher discourse, and in-depth inquiry into subject matters. With regard to the role of teacher preparation for tomorrow’s schools, Yoon says that the majority of co-operating teachers, student teachers and professors believe that the teacher’s role has changed from that of an authoritative figure conveying knowledge to that of a guide or facilitator. Though, some teachers and student teachers admit that fundamentally the teachers’ role has remained unchanged. Co-operating teachers and student teachers felt that recent world events sparked their concern about personality education and student-centred education. Professors recognised that they

had become interested in reminding students of the importance of a vision for the future, in rediscovering the intrinsic nature of education, and in emphasising fundamental values.

Some ideas about the teachers' new roles may be found in the results of questionnaire carried out in autumn 2004 at the University of Helsinki (Meri, 2004). In this study 1165 student teachers and student trainers answered questions related to the areas of expertise and core competences of future teachers. The questionnaire contained 204 scales of semantic differentials (see Tabachnick & Fidell, 2001). The results indicated that teachers value such virtues as commitment, reflection, thoughtfulness, diligence, cooperation, fairness, tolerance and creativity more than teaching skills and subject knowledge. According to Barnes (2008), student teachers need practice. Crucial to student teachers' development is the opportunity to be in a "real" teaching environment, one where they can learn and test themselves.

Smith (2007) who explored how new teachers develop their professional identities and knowledge, also emphasises the importance of experiences. He analyses the stories of four student teachers in their first year as primary teachers. As in many studies, the early experiences of teaching, especially of being responsible for ones' own class, were cited as major sources of learning how to be a teacher. The four teachers frequently referred to their experiences of teaching, but none illustrated how their early life outside school could have coloured their teaching.

A recent UNESCO Report (UNESCO, 2005) *Focusing Resources on Effective School Health* also emphasises life skills. In addition to these, young people also need skills that will help them adapt to changes over a lifetime. They need skills in each of the four pillars of *Education for All*: learning to know, learning to do, learning to live together and with others, and learning to be. Individuals need cognitive, reflective self-management and social skills.

## Research questions and method

In this study, student teachers evaluate the future of preschool and primary school children, specifically regarding the language development and communication in the year 2030. The following research questions were explored:

1. How important is it for student teachers that children in preschool and primary school in the year 2030:
  - a) can use language and communication, and
  - b) can work in groups and in their environment?
2. How will preschool and primary school teachers support language learning and communication in the year 2030?
3. How will children in preschool and primary school in the year 2030 take responsibility for their own (child-centred) learning?

The research method involved a questionnaire, and the data were gathered in October 2007 from 76 student teachers studying at the Department of Applied Science of Education at the University of Helsinki. Of the students, 52 were preschool student teachers and 24 primary school student teachers.

The questionnaire consisted of 70 questions and was created for this particular study. Its design was based on the authors' knowledge and work experience in language

development, communication and teacher training (see Nurmilaakso, 2006). The questionnaire is divided into three subsections according to the three research questions above. Questions 7 to 35 of the questionnaire relate to the first research question (questions 21 and 35 were open questions not covered in this study). Questions 36 to 53 of the questionnaire relate to the second research question (53 was an open question and it is not covered in this study). Questions 54 to 69 of the questionnaire relate to the third research question. This study focuses only on questions 54 to 55. The last question was an open question, and answers to this question are not covered in this study.

Every year, 100 preschool student teachers and 110 primary school student teachers begin their studies at the University of Helsinki. The data for this study has been gathered from the third-year student teachers taking the course “Native language and literature” taught by the author. All of these students had taken at least one course in language development or learning to read and write. All 76 students attending this course answered the questionnaire. The variables were measured on an ordinal (Likert) scale that offered students five options (“very important”, “important”, “I can’t say/somewhat important”, “not so important” and “unimportant”) for each answer. The data was analysed using SPSS (Tabachnick & Fidell, 2001) statistical software, and the frequencies as well as the t-test were implemented for data statistical analysis.

## Results

### *What should children learn in preschool and primary school in the year 2030?*

The student teachers considered as “very important” or “important” (72.0%), that children in the preschool are **prepared for reading**. Most of the student teachers (64.0%) felt that in the preschool, children’s awareness of the language matures. The student teachers believed that children’s self-concept as readers should be positive (94.7%) and that children should show enthusiasm for reading. The students thought that it was unimportant that children learn to read in preschool (68.0%). Less than a half of the students (45.3%) said that it would be good for children learn to read in preschool. And 86.7% of the student teachers believed that the most important responsibility of primary school is to teach children to read.

The results of t-tests between preschool and primary school student teachers results regarding the variables “In preschool children learn to behave in a group”, “Children should learn to read in preschool” and “The sole duty of primary school is to teach children to read” showed no statistically significant difference ( $p < 0.05$  and  $p = 0.05$ ) between the groups. These questions were selected for statistical analysis as for many preschool and primary school teachers in Finland these are issues of high importance. In Finland, the compulsory school age is seven. One half of preschool children can read before primary school. In Finland, the issue of whether the compulsory school age should be six, as it is in many European countries, has generated much discussion.

The student teachers also evaluated how important it is that **children master language and communication** (see Table 1). The majority of respondents thought that it is very important that child can use language in the learning situations to develop her/his own knowledge. Only 26.3% of students said that it is very important that child can use language to achieve his/her goals. Majority of students (61.8%) emphasised that it is very important that child can use language for practical application of learned things.

One's native language is the most important language. Though, it is also important that in future Finns will be able to use diverse languages and have a good vocabulary since Finnish is not common language. However, the student teachers (92.0%) felt that it will not be so important for children in 2030 to speak many languages.

Table 1. Evaluation of the importance of children's mastering of language and communication

Items regarding mastering language and communication	Very important	Important	I can't say/ somewhat important	Not so important	Unimportant	N
Children's language is multifaceted, ranging from rhyming to talking nonsense	21(28.0%)	36(48.0)	15(20.0%)	3(4.00%)	0(0.00%)	75
Children's vocabulary includes many synonyms	7(9.30%)	23(30.7%)	34(45.3%)	8(10.7%)	3(4.0%)	76
Children can speak several languages	0(0.00%)	0(0.00%)	6(8.0%)	35(46.7%)	34(45.3%)	75
Children's language includes loanwords from other languages, such as English	0(0.00%)	2(2.70%)	6(8.00%)	31(41.3%)	36(48.0%)	75
Children speak their own dialect	13(17.6%)	23(31.1%)	22(29.7%)	16(21.6%)	0(0.00%)	74

The student teachers also responded to questions on how a **child can work in groups and in his/her environment**. More than half of students (55.3%) thought that it is very important that a child can use language to explain his/her wishes and needs to an adult. Even more students (78.9%) said that is very important or important that a child can use language in learning situations to develop group knowledge. Many children who experience difficulties with language development and later with learning to read and write also experience difficulties in using language with other children. Many times a child can manage just because it is easier to speak to an adult than to one's peers.

The students said that it is very important (81.3%) that children in preschool learn to work in a group and to use language. It modifies the children's behaviour in their environment. Whether in groups or in their environment, children must use language and communication. The student teachers (57.9%) said that it is very important that child can use language to adapt to his/her environment. This means, for example, that child can ask permission from his/her peers to play together. If a child cannot ask it, he/she may feel as outsider already very early in childhood. Besides, the students (64.5%) considered it very important that a child enjoy communication with other children, fewer student teachers (52.0%) thought that it is very important that child enjoy communicating with adults. It also was perceived as very important that children enjoy their learning and playing.

### *How will preschool and primary school teachers support language learning and communication in the year 2030?*

The duty of teachers in preschool and primary school is to support language development. They can support children's language learning and communication with the actions reflected in Table 2.

Table 2. Evaluation of the role of children's productions for language learning and communication

Children's productions	Very important	Important	I can't say/ somewhat important	Not so important	Unimportant
Children tell stories while an adult writes them down	49(64.5%)	26(34.2%)	1(1.30%)	0(0.00%)	0(0.00%)
Children have ABC-books in the first class	34(44.7%)	29(38.2%)	9(11.8%)	4(5.30%)	0(0.00%)
Children's scribbles have been discussed	32(42.1%)	32(42.1%)	10(13.2%)	1(1.30%)	1(1.30%)
Children's drawings with writings are exhibited and discussed	40(52.6%)	25(32.5%)	9(11.8%)	2(2.60%)	0(0.00%)
Children's writings and drawings have been compiled in an annual portfolio	27(35.5%)	25(32.9%)	12(15.8%)	10(13.2%)	2(2.60%)
Children's own writings are exhibited in the classroom	34(44.7%)	23(30.3%)	15(19.7%)	3(3.90%)	1(1.30%)

Method of children telling a story while an adult writes it down, is a very successful in Finland. The answers suggest that children should see many writings around them and that their drawings, together with writings should be exhibited in the classroom and discussed.

Teachers can support language learning and communication in many other ways. Nowadays children **work and communicate through the Internet and computers**. The student teachers were asked how much these actions encourage language learning and communication. The students (82.9%) said that children are interested in language (e.g., logos in newspapers). According to student teachers, it is not so important that teachers support language learning and communication with multimedia. Only a few students said that teachers can promote language learning in such a way that children use computers and mobile phones very much in preschool and primary school.

### *How will children in preschool and primary school in the year 2030 take responsibility for their own (child-centred) learning?*

The child-centred philosophy has grown in Finland during the past few centuries. In the real world, this means that a child's actions become more and more independent, even in preschool. According to student teachers, these actions promote language learning and communication. Children tell their own stories (89.5%) and frequently (62.7%) draft their own written productions. Children often visit the library as well (67.1%) and this number includes library visits with parents. Children in preschool and primary schools (42.1% very often) use books when trained for language and reading. The student teachers said that children (1.30%) are not so interested in playwriting and reading, which require children to imagine themselves writing and reading even though they really cannot: one example might be when a child (who cannot read) pretends to

teach his/her teddy bear to read (Nurmilaakso, 2006). And children (6.60%) seldom scribble on their drawings.

According to the student teachers, it is important to consider the children's personal goals when planning activities in preschool. Every child's personal learning path must be clarified in preschool (68.4% completely agreed or mostly agreed). Children in preschool and primary school in the year 2030 should take responsibility for their own (child-centred) learning.

However, all student teachers admitted that planning such activities – or adult's planning – is not so important. The majority (81.6%) said that one's learning difficulties must be handled already in preschool and that co-operation between preschool and primary school education should be regular (76.3% completely agreed).

One must begin with every child's personal motivation and personal learning path, and co-operation between preschool and primary school education should be regular. The student teachers thought that it is important for every child to receive detailed feedback on his/her own work (93.4% completely agreed). The students thought that it would be good for children to realistically evaluate their own work (42.1% mostly agreed). The student teachers (75.0% completely agreed) hoped that children would enjoy their learning.

## Discussion

The results of this study confirm the conception that preschool and primary school teachers and student teachers think very traditionally. For example, many felt that it will not be so important for children in 2030 to speak many languages. This finding is very surprising because knowing other languages is a lifeline for Finns, since so few Finnish speakers exist outside of Finland. According to Gardner (1999), the school and the church are such uncommon institutions in that they have changed little during the past hundred years, even as the society around them has changed tremendously and moves more quickly. The results of this study support these opinions.

Winch, Johnston, Holliday, Ljungdahl, and March (2001) suggest that a modern child, already at very young age, encounters an environment full of texts. Researchers advise that adults and day care centres provide the opportunity for children to be open to texts, and adults must help children practise reading and writing to prepare for school. These early encounters with learning environment are unexpectedly valuable, especially if the children begin to understand what it means learning to read and to write, and how to use these skills in the social realm in which they live (see also Jalongo, Dragich, Conrad, & Zhang, 2002; Whitehead, 2003; Nurmilaakso, 2003). In this study, the student teachers admitted that it is very important that child can use his/her native language fluently. Nowadays, a child is born into a society which surrounds him/her with scribbles, brochures, pictures and so on. The environment is full of different kinds of writing. When the child is very young, he/she can already begin to recognise different signs. A two- or three-year-old child knows where a shop is when he/she sees its name or logo. In this way children learn to read their environment. The world has changed and so has the conception of how children learn to learn.

Tella (2003) says that teachers' resistance to multimedia such as computers and mobiles in education is worrisome because teachers at all levels and in all sectors are key in shaping the knowledge society. Possible reasons for teachers' low motivation to

use technology in their teaching could stem from a fear of seemingly obscure and dauntingly complex concepts such as e-learning which, according to Tella, is a kind of cliché. In addition, technologies have been overemphasised, especially during the 1990s, because of the popularity of developing and testing e-learning platforms.

On the other hand, the overemphasised role of the constructivist approach may also be an obstacle. Finally, according to Karevaara and Thuss (2002), few teachers really understand what “technologies” mean, particularly as the distinction between hardware and software technologies fades due to the multi-layered nature of programming. Chen and Chang (2006) are of the same opinion. Although computer technology has been recognised for its great potential to enhance teaching and learning, the results of their recent studies indicate that many early childhood teachers are not ready to integrate computers into the classroom.

Perhaps the student teachers believe that preschool and primary school children are too young to need the latest technology. According to Reunamo and Nurmilaakso (2006), however, young children need secure and sufficiently permanent surroundings for balanced development. Long-term relations and good daily routines are the foundations of a healthy childhood. Perhaps it is because young children themselves change so quickly in their early years that they need relatively stable conditions for their upbringing. Our world changes faster every day. As a result, children need peace and love to adapt better to markers of change, such as computers, because children must experience such changes early in their childhood.

Nevertheless, we must always remember the culture in which we live when we speak of the future. Pedagogical views are deeply rooted in the functions of our basic understanding of early childhood learning. These roles also call for a new interpretation of children’s use and learning of language. Language is not just a means for communication or understanding; it is also an important ingredient in cultural production. Learning and teaching are interwoven and they cannot be considered separately. In the future, the teacher’s task will be to understand the link between different types of learning and between different pedagogies and to choose which is the most appropriate for a given situation (Reunamo & Nurmilaakso, 2007).

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## DEVELOPMENT OF CREATIVE ACTIVITY OF PROSPECTIVE VISUAL ART TEACHERS

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### Abstract

*The main task of training secondary school visual art teachers is to develop intelligent, socially active and creative individualities graced by knowledge and skills in pedagogy, psychology and art, as well as by abilities for self-development and self-education. These teachers need well-developed teaching skills and competence, proficiency in promoting their students' acquisition of artistic knowledge and competence in modern art. Besides, they should be able to creatively deal with unusual artistic tasks and to respond to the changes in contemporary art and culture, since alongside the teacher's qualification, these teachers are conferred the Bachelor Degree in Art. Therefore, creative study work is one of the significant stages in the development of professional skills for the prospective secondary school visual art teachers. In order to accomplish the tasks set, the work of the teacher educators should be directed towards the development of student's creative activity, so that they can independently and regularly develop their creative skills. The aim of the study has been stated to work out and theoretically substantiate the model of creative process aimed at facilitation of prospective secondary education art teachers' creative activity.*

**Key words:** *prospective visual art teachers; creativity; creative activity; model of creative process.*

### Creative personality and development of creative activity

The UNESCO report on the perspectives of higher education in the 21st century underlines the fact that the rapid changes in the contemporary world require a new approach to the role of higher education. It should focus on students who will be the creators of social consciousness in future. The importance of young people's creative activity for emancipated life in a multicultural society is emphasized in the report, too. In this connection the necessity to make conceptual changes in higher education (including the professional higher art education) and to encourage innovations in pedagogy and didactics are mentioned (UNESCO, 1998).

Education has to give a student an opportunity not only to survive, but also to develop the self considering the goal of sustainability: "The sustainability has the specific dimensions; the content and interaction of these dimensions show the societal necessity

of the flexible reaction toward the changes in the development of humanity and nature, education and science, human consciousness and activities for sustainability” (Salīte, Mičule, Kravale, Iliško, & Stakle, 2007, p. 289).

The daily routine of the students enrolled on the secondary school visual art teacher’s programme is inconceivable without the continuous presence of creative activity. It is necessary for accomplishing the academic study tasks at university and unassisted creative art works done at home and in studios. To achieve profound and consistent results, creative activity has to become part of students’ life, and the development of creative personality is necessary for this matter. Creative individuality is objective and unique wealth of the society. It is free and independent, rich in initiative, morally balanced, harmoniously (aesthetically, morally and intellectually in particular) developed, creatively capable being (Hibner, 1998). In his recent article Mumford describes the requirements for creative people:

*Creative people must be able to generate the likely downstream consequences implied by a new idea; they must be able to project other’s reactions to an idea; they must be able to identify the resources needed for idea implementation; they must be capable of forming viable, perhaps somewhat opportunistic, plans for implementing these ideas; they must be able to identify significant problems emerging during implementation; and they must be able to adjust their initial plan, or approach, to take those implementation issues into account, considering both immediate and long-term objectives (Mumford, 2003, p. 116).*

Summarizing various studies carried out by scholars in Latvia, Russia and other countries, it is possible to identify the following qualities of a creative personality (James & Asmus, 2000-2001; Ikere, 2008; Glück, Ernst, & Unger, 2002; Mumford, 2003; Sawyer, 2006; Вишнякова, 1995; Кривцун, 1997; Тюрин, 2001):

- *receptiveness to new specific knowledge and experience;*
- *inquisitiveness;*
- *flexible thinking;*
- *appreciation of novelty and originality;*
- *broad interests;*
- *disposition for self-realization;*
- *ability to view the problem “from afar”;*
- *intuition and intense feelings;*
- *ability to develop a viable idea, persistence, dynamic advancement and devotion to the problem solution;*
- *certainty about the correctness of one’s judgement, readiness to take risks;*
- *tolerance to ambiguity;*
- *independence and self-dependence;*
- *aesthetic feelings, aspiration to the beautiful.*

Many scholars consider that any person can be creatively active (Tan, 2004; Varzim, 2005), it is just necessary to reveal and develop the creative potential of personality.

According to Sawyer (2006), creativity can be characterized by contrasting what it is not and what it is:

- *Creativity is not a special mental process, but involves everyday cognitive process.*

- *Creativity is not a distinct personality trait; rather it results from a complex combination of more basic mental capabilities.*
- *Creativity does not occur in a magical moment of insight; rather creative products result from long periods of hard work that involve many small mini-insights that are organized and combined by the conscious mind of the creator.*
- *Creativity is always specific to a domain. No one can be creative until they internalize the symbols, conventions, and languages of a creative domain (p. 74).*

However, even very creative personalities do not exhibit all the features of creativity at equal rate, though it is possible to develop purposefully each of them. Many scholars (Keršėnšteiners, 1925; Hibnerė, 1998; Lubart & Georgsdottir, 2004) note that great influence, by stimulating and developing the students' creative activity, can be exerted by a lecturer's personality and the quality of teaching. In his article about Singapore's creative education, Tan indicates the responsibility of teachers:

*Teachers must acquire pedagogical competence (e.g., planning lessons, selecting suitable teaching models and managing behaviors). They should process sufficient content knowledge and skills and must be interested in teaching effectively and creatively. In addition, they should also acquire creative skills and techniques, as well as cultivate dispositions related to fostering creativity (Tan, 2004, p. 288).*

University teacher's efficient activity is impossible without such elements of pedagogical competence as erudition, fondness for the study course delivered, ability to explain difficult subject matter in plain language. If we want to foster the idea of cultural sustainability through education and especially through teacher education, both university teachers and future teachers' understanding of the aim of education is of a great significance; their current problems and hopes determine the form and content of teachers' individual and professional frameworks (Salite, 2006).

The development of creative activity of students taps into students' interests, prior knowledge, learning styles, and strategies in an attempt to nurture knowledge construction, perseverance, and intrinsic motivation (Rostan, 2006). Therefore, we would like to characterize the development of students' creative activity as a regular and focused coordinated work of the teacher and students. The university teacher's activity is directed towards the development of the study course content and the use of appropriate teaching methods, which allows for the development of students' interest in creative activity considering both the level of students' artistic qualification and their capabilities to work creatively. Working creatively both under the teacher's guidance and independently, the students develop their creative potential.

The essence of creative activity is not the apparent activity, it is the internal act of creation or creative process. If the students build on their experience, thoroughly analyzing both positive and unsuccessful results of their creative process, their creative activity becomes more productive. Regular analysis of creative process gives the students an opportunity to reach the highest level of creative activity – the level of creativity (Šlahova, Čačka, Volonte, & Savvina, 2007). It means that every creative activity includes the creative process encompassing successive performance of the creative tasks, i.e., the process of creative activity develops according to the specific scheme.

## Model of a creative process

The creative process is the sequence of thoughts and actions that lead to a novel, adaptive production (Lubart, 2000-2001). Researchers look for common characteristics of all kinds of creative processes in order to develop a general theory of a creative process and creative abilities. Lately it has been acknowledged as the common process that constitutes the basis for all kinds of creative work: the combination of elements in order to gain a new quality and, afterwards, to search for the revelation and the selection of “significant” combinations. The difference is reduced to the difference in an idea. Now we shall elaborate on some conceptions in this direction.

Analysis of theoretical and empirical investigations verifies that the development of a creative process proceeds through several closely interrelated stages. This is a very complex process, depending on different variables and experiences. Experience builds and grows gradually and creativity develops through the specific stages or levels. Several scholars, who have done research on this issue, identify different stages of the creative process and name these stages differently.

The English researcher Wallas (1926), one of the founders of creativity research in education, distinguished between five stages of the creative process:

1. *Preparation* (preparatory work on a problem that focuses the individual's mind on the problem and explores its dimensions);
2. *Incubation* (where the problem is internalized into the unconscious mind and nothing appears to be happening externally);
3. *Intimation* (the creative person gets a ‘feeling’ that a solution is on its way);
4. *Illumination* or insight (where the creative idea bursts forth from its preconscious processing into conscious awareness);
5. *Verification* (where the idea is consciously verified, elaborated, and then applied).

Many scientists (Fontana, 1998; Groborz & Nęcka, 2003; Lubart, 2000-2001; Mace & Ward, 2002; Norlander, 2000-2001; Sawyer, 2006; Ландау, 2002) lately have distinguished four stages of the creative activity.

For example, Sawyer (2006) in his research distinguishes and explains the following stages of creative process that are undoubtedly based on the stages by Wallas:

1. *Preparation* is the initial phase of preliminary work: collecting data and information, searching for related ideas, listening to suggestions.
2. *Incubation* is the delay between preparation and the moment of insight; during this time the material prepared is internally elaborated and organized.
3. *Insight* is the subjective experience of having the idea – the “aha” or “eureka” moment.
4. *Verification* includes two sub-stages: the evaluation of the worth of the insight, and elaboration into its complete form (p. 58).

The mentioned stages are generally accepted by many researchers, sometimes with some variations in title or number of stages. Thus, Osborn (1953) expanded the list to seven stages: 1) *orientation* (pointing out the problem); 2) *preparation* (gathering pertinent data); 3) *analysis* (breaking down the relevant material); 4) *ideation* (piling up alternatives by way of ideas); 5) *incubation* (‘letting up’ to invite illumination); 6) *synthesis* (putting the pieces together); 7) *evaluation* (judging the resulting ideas).

The analysis of pedagogical experience while teaching students majoring in art specialities (Slahova, Volonte, Cacka, & Haw, 2006) confirms the development of

creative process within the five stages established by Wallas (1926). This division is more relevant and precisely reveals the essence of the creative process of students. For instance, within the study courses in drawing, painting, design, etc. the performance of creative works consists of the tasks to be done in succession, and these tasks correspond to the five stages of creative process characterized above:

1. Emergence of the idea for a work and creation of the first drafts (*preparation*);
2. Development of drawings, drafts, sketches dealing with the idea put forward in the draft and the design of the future work of art (*incubation*);
3. Draft in the art technique chosen for the work (*intimation*);
4. The process of creating a work of art (*illumination*);
5. Completion of the work and making the last corrections (as well as the design, for example, framing) (*verification*).

The common principles of the development of the five-stage creative process for the students majoring in Art are presented in the model (see Figure 1). This model is based on the scheme worked out by Mace and Ward (2002, p. 183) and it has been adapted for the work with students under the teacher's guidance. The original model by Mace and Ward consists of four phases or stages: art work conception (1); idea development (2); making the artwork (3); finishing the artwork and resolution (4). Their model has been worked out for artists, and therefore it is natural that it lacks the stage of intimation, which is directed towards the choice of an art technique and material. The stages of our model can be described as follows:

*Stage 1: creative beginning (preparation).* The stage determines a preliminary analysis of the problem, definition of the idea. The art begins when the idea is still in its uncertainty (Hegel, 1998). Therefore, the preliminary understanding of the artwork is often conceptually vague. The conception of the idea emerges from the theme of the task received, from the interaction of a student's experience in creative activity and outer influence of the teacher during the consultations and communication with course-mates. During this stage the student actively works to create different sketches and compositional drafts of the future creative artwork.

*Stage 2: aggregating information and generating ideas (incubation).* The stage of incubation does not involve any voluntary intellectual work connected with the definite problem. A person can knowingly deal with other problems or simply relax, taking a rest from this particular problem. On the subconscious level mind continues its work on the problem thus ensuring the emergence of combinations of ideas. Unconscious views reject the majority of these combinations as senseless, but sometimes they also generate promising ideas.

Under favourable conditions, from all the ideas proposed, a person selects one (sometimes two) solution, which best reflects the theme of the task set and contains the elements of novelty and originality. The draft is complemented and improved and the composition of the idea is specified. The idea of the artwork can change any time during the creative process.

*Stage 3: creative process of progression (intimation).* When the idea has been found, fixed, studied and has found its place in a student's consciousness, there begins a specific process during which the idea attracts whole spectrum of knowledge possessed by the student. All these observations and facts are used for the implementation of idea and are connected with the task. During this stage the artworks may undergo some changes

aimed at adjustment of the idea. The essence of this stage is that the student looks for and determines the technique to be used in his/her work.

*Stage 4: creative technologies (illumination).* During this stage of conscious activity the previously approved idea is implemented using the technique and the material selected for the work.

*Stage 5: creative result (verification).* Exactly during this final stage the artwork is checked for the last time and its relevance is evaluated, the author makes a decision to finish the work, to correct it, or to start a new work in order to implement the same idea.

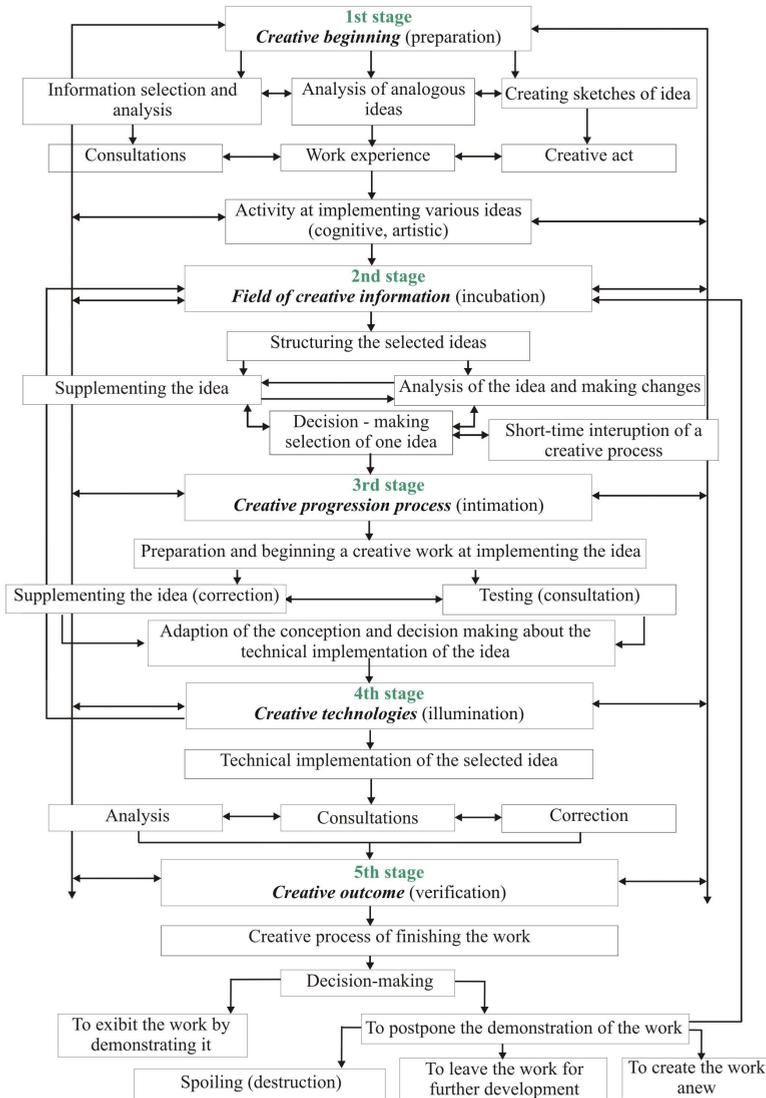


Figure 1. Model of a creative process development for visual art students

One of the most important features of the model is that it provides a full description of the creative process beginning with the consideration of the idea and ending with the finishing of the work. The model demonstrates that the students' creative potential can be improved at any stage of creative process. These stages, in our opinion, characterize the essence of creative process in a context of sustainable art education the best way.

The teacher guides the students carrying out the creative task during all stages of creative process. The teacher's task in the development of the students' creative activity is to influence their inner world by the help of external stimuli, stirring intellectual, emotional and volitional spheres, i.e., to create an emotional creative environment stimulating the students' eagerness to perform creative works.

During the recent years a number of educational researchers and psychologists (Glück, Ernst, & Unger, 2002; Groborz & Nečka, 2003; Lonergan, Scott, & Mumford, 2004; Lubart, 2000-2001; Lubart & Georgsdottir, 2004; VanTassei-Baska, 2006; Кларин, 1995) have turned their attention to the possibilities of the development of the students' creative activity and have proposed various recommendations. In the context of the present research these recommendations have been interpreted for the development of creative activity of the students majoring in Art study programmes:

- *To divert internal hurdles from creative manifestations.* For the students to be ready for creative search, they have to be encouraged: it is necessary to create the atmosphere of inner freedom and understanding during the practical classes in visual art. Students should not be afraid of making mistakes, presenting all their ideas in produced drafts using different art materials and techniques.
- *To pay attention to the work of unconsciousness.* Even when the problem is not in the focus of our attention our sub-consciousness might work insensibly. The students must be taught to duly fix the ideas, subjects, and compositions by doing quick drawings, sketches, drafts, which can appear all at once, and so that they could be used when necessary.
- *To refrain from evaluation (marks).* This condition is especially important at the very beginning of creative activity. The academic tasks in visual art are to be evaluated only on the basis of definite criteria, it is necessary to explain the tasks to be done for the art work beforehand. Evaluating the creative works we should only analyze the level of artistry, and not assess them by marks. Due to these preconditions the students are more open and free in expressing essentially different ideas, not afraid of making mistakes, devoting more time and paying more attention to discussion of the idea generated and of the ways how to implement or present it better.
- *To show how to use the analogues (for example, original works).* Research of creative process demonstrates that the possibilities of creative search grow if students' own ideas are compared to the existing artistic search, composition and colour development in the works by famous painters. Allowing for imitation of creative behaviour it is necessary to include the tasks to copy the works done by renowned painters in all courses of art; having accomplished the tasks students interpret their own work comparing it with the original.
- *To give the possibility to practice.* Carrying out small creative tasks develops students' confidence. Such a training of the hand and the eye should take place parallel to the accomplishment of the long-term academic works done at class.

- *“To discipline” imagination and vision.* Creating the conditions of inner freedom during the creative process we should review the ideas critically, partially rejecting the compositions that are not so successful.
- *To avert inner hurdles of thinking.* To create such conditions that students would understand (feel) that any idea, sketch of composition or draft is worth of attention and that it will be benevolently analyzed.
- *To develop perceptivity, to enlarge the sensitiveness, amplitude and depth of perception.* This can be dealt with under the teacher’s guidance while developing creative perception. To implement this recommendation more successfully organizing regular meetings with artists, attending museums and galleries, inviting artists to conduct art workshops and to give master classes would be necessary.
- *To develop the necessity to use theoretical knowledge in art when implementing the creative tasks.* In practical work students put into practice the laws of composition and view, academic fundamentals of drawing and painting, various techniques and artistic materials. The developmental process of creative activity has to take place in the interaction of practical activity and theory.
- *To help to discern the meaning,* the general direction of one’s creative activity, to be self-aware of ability to deal with creative tasks participating in exhibitions, workshops and other artistic projects. Without such understanding all the exercises stimulating creative activity might be perceived as simple entertainment.
- *To teach students to plan and control their creative activity.*
- *To develop the creative behaviour in the presence of a positive role-model.* This recommendation can be observed getting involved in the creative study process and workshops conducted by well-known artists – practitioners.

## Conclusion

One of the professional features of a secondary school teacher of visual art holding a Bachelor degree in Art is his/her ability not only to carry out pedagogical creative work, but also the ability to be involved in creative activity himself/herself. A teacher has to be aware of and develop in himself/herself the value of creative work as the basis of his/her profession, and he/she should feel free doing creative work.

All this makes us review the essence of the educational process of secondary education visual art teachers, where the priority is the development of the prospective teachers’ creative activity. Taking it into consideration it is necessary to create such psychological and pedagogical conditions of the study process, that there are no obstacles to creative self-realization.

One of the functions of Art subjects is to bring forward the students’ creative abilities and to develop them to the utmost. Favourable conditions for the productive creative activity of every student can be created by the teacher who is competent in the basic aspects of educational psychology and who can be flexible in organization of the development of the students’ creative process.

To solve this problem we worked out the model of the development of creative process, that could foster the effectiveness of the students’ creative activity. The scientific

approach used to develop this model is based on the theoretical research and the analysis of pedagogical experience, as well as on the reflection of approved theoretical perspectives of the creative process development.

The aim of the proposed model is to help the students to foster their creative activity when dealing with artistic tasks purposefully and effectively. The stages of the creative process reflected in the model include the succession of students' logical actions that trigger their creative activity. The model of the creative process also presents the structure of every stage and the preconditions that allow for the performance of the creative acts characteristic of the given stage.

The model of creative process is directed towards the sustainability education and reflects objective laws of creative activity and its flexible character. The model can be used not only in work with the prospective art teachers, but also with the students from other study programs, for example, for music teachers or teachers of history of civilization.

The criterion of viability of this model is its practical usefulness. Moreover, the practice allows for adjustment of the model in accordance with the peculiarities of every study course in Art. Therefore the existence of definite examples of its usage is an obligatory precondition for the model of the development of creative process proposed for consideration.

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