

## ENVIRONMENTAL EDUCATION IN SECONDARY SCHOOLS IN LATVIA

### VIDES IZGLĪTĪBA VIDUSSKOLĀS

**Linda Bertaite**, Bc.Sc. Ing.

Riga Technical University, Institute of Energy Systems and Environment

Address: Kronvalda Boulevard 1, LV1010, Riga, Latvia

Phone: 371+7089923, Fax: 371+7089923

**Jūlija Gušča**, Mg. Sc., PhD student

Riga Technical University, Institute of Energy Systems and Environment

Address: Kronvalda Boulevard 1, LV1010, Riga, Latvia

Phone: 371+7089923, Fax: 371+7089923

e-mail: [julija.gusca@eef.rtu.lv](mailto:julija.gusca@eef.rtu.lv)

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### Introduction

Through the ratification of the three Rio Conventions- the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity and the United Nations Convention to Combat Desertification- the Republic of Latvia has committed to fulfill obligations in the environmental sector. These obligations require the country to educate the public and to develop awareness on environmental issues or facilitate and improve existing knowledge about the importance of biodiversity conservation, the significance of climate change and the reasons contributing to land degradation and desertification. Such education work can be conducted through educational institutions, as well as by involving non-governmental organizations and the mass media. At the moment there are by tens of organizations which actively deal with topical environmental issues in Latvia. However such an informal teaching form is still not capable of securing a high enough level of environmental science education among the youth. It is specifically the youth (elementary and secondary school pupils), however, who are the most important part of society to educate. It is much easier and more effective to develop the awareness on environmental issues of children and the youth than adults and the former are more inclined to accept new ideas, especially if the topic succeeds in attracting their attention. The schools should take primary responsibility in the education of the young generation on the environment, however in order to do this effectively, an evaluation of the current situation in the sphere of environmental education in schools is needed.

### The role of Environmental Science in the education system of Latvia

Environmental science is an independent and generally accepted science: it solves environmental problems, offers environmental friendly management tools, develops cleaner technologies accordance to the existing legislative situation and even stimulates the creation of new

regulations towards environmental protection. According to the classification of the Latvian educational system, environmental science is included in the thematic group of natural science and mathematics. Environmental science is run as an interdisciplinary theme and is integrated within the content of various courses as biology, geography, chemistry, physics and natural science. New disciplines' standard projects prognosticate that environmental science and sustainable development issues are included in each course taking into account the specific features of those courses, thereby ensuring and aligning succession between different educational levels.

- Biology -- In connection with the above mentioned directives, themes about conservation of biodiversity are discussed (intensive and biological principles of agriculture, nontraditional types of agriculture, biocenosis, ecosystem, biosphere, biodiversity of different organisms, etc.). However some topics about climate change, land degradation and sustainable development are also included in the course.
- Chemistry includes several themes on environmental protection, mainly about the identification and prevention of pollution, as well as improvement of water, air and soil quality.
- Physics is mainly adverted to the role of experimental and modeling methods in environment and nature research, the effect of physical processes /noise and sound/ on processes in nature, energy efficiency and energy saving opportunities in household, energy efficient technologies, etc
- The educational programme in geography draws attention to global climate change processes, sustainable management in different sectors (agriculture, geographical economics, etc.), reasons and consequences of land degradation and desertification.
- Natural science course includes general information about environmental issues, which are discussed in more detail in the biology, physics and chemistry courses.

As it is shown, the courses include themes covering the three Rio Conventions (on climate change, land degradation and biodiversity), as well as the themes linked to the conventions -- resource management, sustainable development, waste management, etc.

## **Methodology**

The objective of the paper is to obtain information about the existing situation in the area of environmental education in Latvian secondary schools by applying questionnaire and interviewing methods. The schematic description of the methodology approach is shown in Figure1.

According to international legislative documents regarding environmental and sustainable development and the responsibility in fulfilling those by Latvian government, it is necessary to investigate the following:

- To what degree and how efficient environmental science and sustainable development issues (especially in the context of 3 Rio Conventions: UN Framework Convention on Climate change, Convention on Biodiversity and Convention on Land degradation and Desertification) are included in the all-round educational programme in Latvia;
- Is the implementation of an independent course on environmental science required;
- If the environmental issues taught in different courses are not duplicated among those courses causing overwork for pupils;
- What the knowledge level of pupils in environmental science issues is;
- What the knowledge level of the teachers, responsible for lecturing the courses where the environmental issues are integrated in, is;

- If the number of hours per course dedicated to environmental science is sufficient;
- What changes must be implemented by the Ministry of Education and Science to improve the knowledge level and promote environmental science among pupils and teachers.

To provide answers to the above mentioned questions, several interviews among pupils and teachers about environmental issues and sustainable development were carried out in five schools in different regions of Latvia (in Dobeles, Preiļi, Rīga, Valmiera and Ventspils). These schools were chosen randomly with the main idea to cover each of four Latvian regions and the capital as a separate and more developed region: three from five schools are gymnasiums (in Dobeles, Preiļi, Valmiera): it was expected that the knowledge level in the gymnasiums would be different from two secondary schools in Rīga and Ventspils. It should be mentioned that in the case of Ventspils, a Russian speaking school was interviewed. This fact might slightly affect the results between the schools, because at secondary school level mathematics and natural science subjects are learned in Latvian, not in the mother tongue.

The methodology used for the research is shown below.

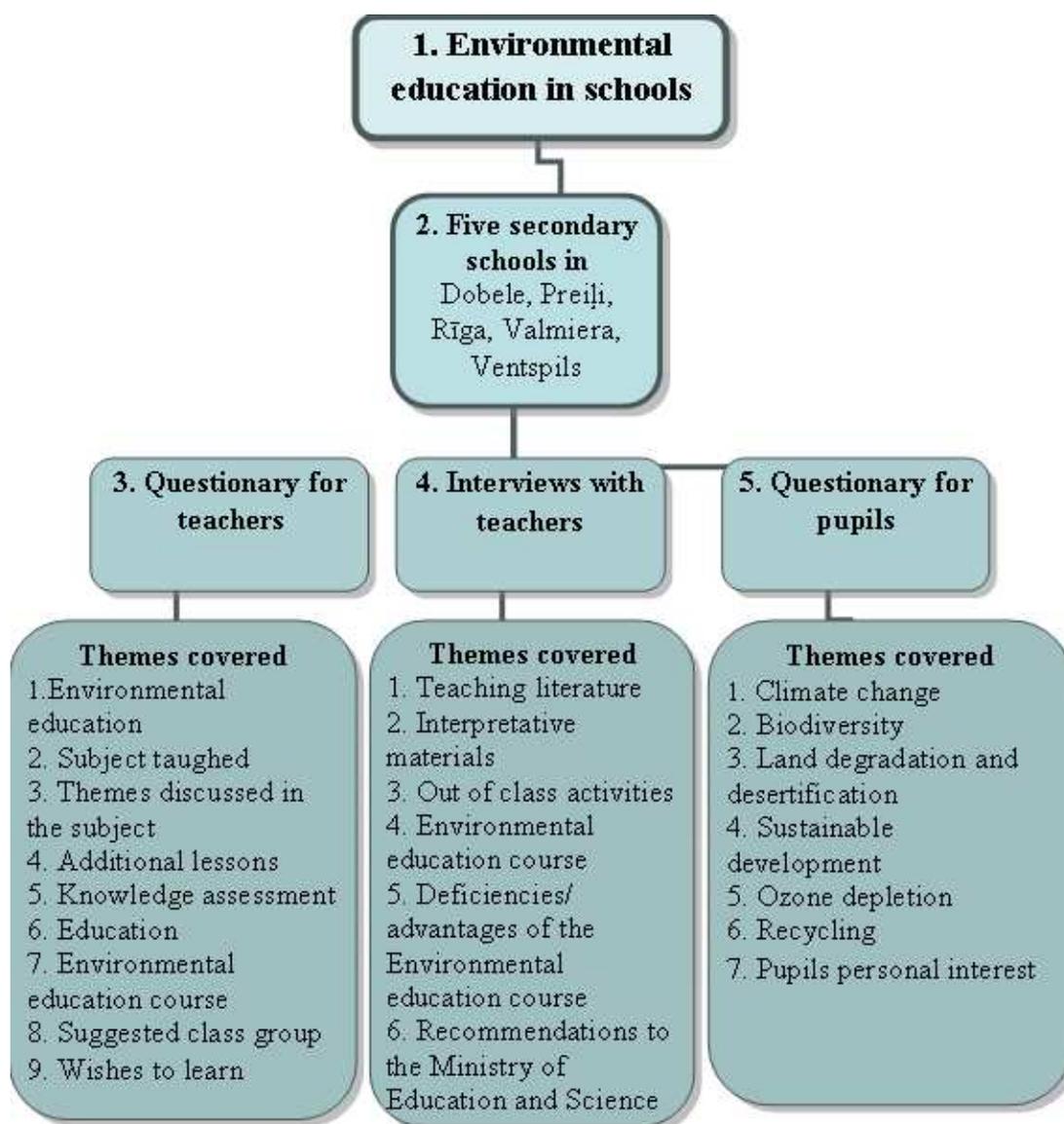


Figure1. Methodology of the research

## Results

Inquiry of teachers was carried out using direct method, i.e. interviewing, in five Latvian schools and through indirect method- sending questionnaires by fax to 35 Latvian schools in different regions. In total, 26 questionnaires were filled in, 12 questionnaires from three schools were received by fax. In above mentioned five schools in Dobeles, Preiļi, Rīga, Valmiera and Ventspils in total 14 interviews were conducted.

The greater part of teachers evaluated their knowledge in environmental sector as good and very good. Additionally, the knowledge was gained at courses on improvement of professional skills (21 respondents), at home (21 respondents) and only 10 of all respondents have a degree in environmental, engineering or natural sciences or linked pedagogy sciences. Figure 2 shows the review in the results.

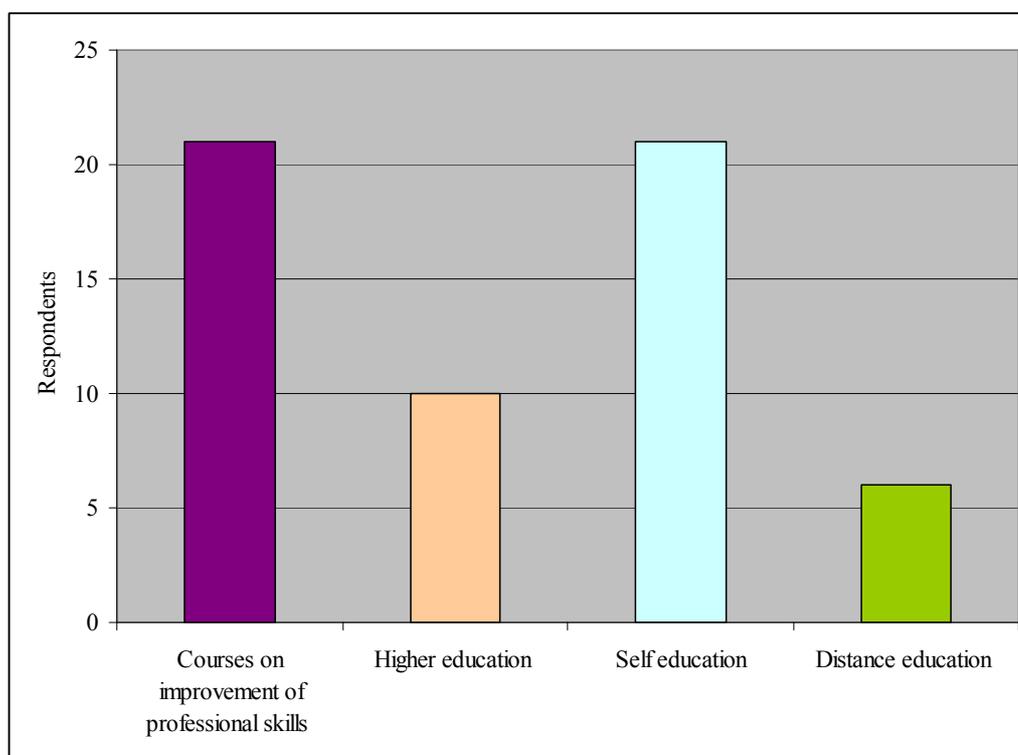


Figure2. Resources for professional improvement of knowledge in environmental education used by teachers

Currently in Latvia discipline programmes do not define in which classes the environmental science subjects must be taught -- environmental issues are integrated in programmes in a chaotic way from the primary to secondary school levels. However, the results show that 57% of respondents emphasized that environmental and sustainable development topics must be studied in all classes, 31%- in class category from 10-12 classes and nobody approves the necessity to teach it for primary school pupils.

The knowledge level of pupils cannot be articulated: it is varying from low to average. There is no coherence between the knowledge level and the regional features of the school. Thus it could be concluded, that the level depends on individual factors, like the personal attitude of teachers and pupils to environmental problems, methods of teaching used, participation in informal environmental activities. The results of the research show that pupils are more competent in

general topics interesting for them not only in school life but also in household like waste recycling and sorting.

During the interviews teachers passed a number of recommendations to the Ministry of Education and Science regarding the integration of environmental education in scholar programmes:

- At the state level to appoint responsible institution for integration of environmental topics into natural science subjects;
- To develop particular programmes and methodological guidelines for each subject, avoiding duplication of themes and defining the themes of lectures for teachers;
- To develop and produce educational literature on environmental protection for pupils and teachers;
- For improving the knowledge on environmental issues it is necessary to ensure regular education or topical discussions for teachers about environmental themes included in methodological guidelines;
- More attention must be drawn to informal environmental education -- participation in competitions, information campaigns, joint social work, etc.

## **Conclusions**

During the research "Environmental education in secondary schools in Latvia" the following conclusions were done:

1. The main obstacle regarding efficient implementation of the three Rio conventions in Latvia is the lack of educational human resources in schools – key specialists, as well as support staff;
2. The knowledge level of chemistry, physics, geography teachers is lower than biology and natural sciences teachers, where environmental issues and sustainable development themes are integrated deeper;
3. Themes taught by teachers conform with educational programmes of courses, besides additional themes on global and regional innovative environmental approaches and processes are lectured during the courses;
4. Teachers believe that there is no necessity for development of a separate subject as environmental science. The integration of environmental issues into natural science subjects must be continued, pointing such education to secondary school level, i.e. classes 10, 11, 12;
5. The greater part of teachers interviewed during the research have gotten the knowledge in area of environmental protection during the studies in universities or distance education courses. Though self appraisals of teachers demonstrated that the learning process has to be continuous and regularly improved;
6. For better integration of environmental and sustainable development themes in school programmes, there is strong necessity for qualitative educational materials for teachers and pupils;
7. Environmental science subject might be integrated in school programmes as a voluntary subject like History of civilization, Music, Drawing, etc.;
8. Knowledge level of pupils regarding environmental issues differs. However there is no interconnection between the knowledge level and regional location of schools. Better results have been shown by the pupils of gymnasiums;
9. Before implementation of a separate course on environmental science it is necessary to make a detailed inventory of educational programmes in order to identify subjects where topics may duplicate. Finally the system for elimination of such duplication must be created.

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### **Bērtaite L., Gušča J. Vides izglītība vidusskolās.**

*Vides problēmu aktualizēšana un tādi globālie procesi kā klimata pārmaiņas, zemes degradācija un biodaudzveidības samazināšanās mudina valstis pildīt vairākās ANO konvencijās noteiktās starptautiskās saistības: ANO Konvencijā par klimata pārmaiņām, Konvencijā par cīņu pret pārtuksnešošanu/zemes degradāciju, Konvencijā par bioloģisko daudzveidību. Latvija ir parakstījusi šīs konvencijas, līdz ar to valstij ir jāpilda konvencijās izvirzītās prasības, integrējot tās nacionālajos normatīvajos aktos. Izpēte ir vērsta uz esošās situācijas analīzi vides izglītības jomā Latvijas skolās, balstoties uz valstiski apstiprinātiem mācību priekšmetu standartiem ķīmijā, ģeogrāfijā, bioloģijā, dabas zinībās utt. Pētījuma laikā skolēnu un skolotāju vidū tika veikta aptauja par vides jautājumiem. Aptaujas mērķis bija iegūt informāciju par skolotāju un skolēnu zināšanu līmeni vides jautājumos, kā arī sniegt atzinumu par skolēnu vispārīgo ieinteresētību vides problēmu risināšanā. Pētījuma nobeigumā, ņemot vērā skolotāju priekšlikumus, ir izstrādātas rekomendācijas LR Izglītības un zinātnes ministrijai par vides izglītības kvalitātes uzlabošanu Latvijas skolās.*

### **Bertaite L., Gusca J., Environmental education in secondary schools in Latvia.**

*Actualization of Environmental problems as well as global impact to such processes as climate change, desertification and decrease of biodiversity are guiding countries to fulfill the national obligations upon the United Nations Conventions: UN Convention on Climate Change, UN Convention on Desertification and UN Convention on Biodiversity. All the Conventions are validated to Latvia, thus the requirements of those must be implemented in national legislation. The paper gives the overview on existing situation in environmental education in Latvia schools based on state educational programmes of chemistry, biology, geography, nature science, etc. From the other hand the questionnaire beyond the schools was performed: on this case two types of questionnaires about environmental issues were carried out- for pupils and teachers. The questionnaire expected to get the information on proficiency and background education of teachers, knowledge on environmental issues from pupils as well as general attitude (informal education) to environmental protection from both sides. As a final step of the investigation, the recommendations about the improvement of environmental education process in schools for the Ministry of Education and Science are developed taking into account the comments from the teachers' interviews.*

### **Бертайте Л., Гуца Ю., Экологическое образование в средних школах.**

*Актуализирование проблем окружающей среды, а также такие глобальные процессы, как изменения климата, деградация земли и уменьшение биологического многообразия способствует государствам выполнять международные обязательства в рамках конвенции ООН: Конвенция об изменении климата,*

*Конвенция по борьбе с опустыниванием, Конвенция биологического разнообразия. Латвия подписала конвенции и в связи с этим государству надо выполнять выдвинутые требования, интегрируя их в национальные законодательные акты. Исследование направлено на анализ существующей ситуации в области экологического образования в латвийских школах, основываясь на утвержденных стандартах учебных предметов химии, географии, биологии, природных наук и т.д. Со второй стороны во время исследования было проведено анкетирование по вопросам защиты окружающей среды. Цель опроса была получить информацию об уровне знаний учеников и учителей в области защиты окружающей среды, а также получить представление о всеобщей заинтересованности школьников в решении вопросов защиты окружающей среды.*