Sustainable Development in the Baltic Sea Region – Focus on Education

Edukacja na rzecz zrównoważonego rozwoju w regionie Morza Bałtyckiego

redaktor naukowy

Arnold Bernaciak

Sustainable Development in the Baltic Sea Region – Focus on Education

volume editor

Arnold Bernaciak

Contents

Theoretical and Methodological Problems

Studies and Research Works

Discussions, Reviews, Good Practices

Spis treści

Zagadnienia teoretyczne i metodyczne

Badania i analizy

Dyskusje, przeglądy, dobre praktyki

Introduction

Malcolm X, an American human rights activist once said that: "Education is the passport to the future, for tomorrow belongs to those who prepare for it today." Although these words were spoken in the middle of XX century, how great is their relevance to the challenges facing the world in the early XXI century. Their specific meaning is exposed through the concept of sustainable development. The concept which attempts to combine socio-economic growth with the requirements of nature and environmental protection. Social understanding of the validity of goals and initiatives taken on the basis of the concept of sustainable development is the key factor in changing the course of economic development towards its increasing sustainability and, simultaneously , preserving the viability of habitats and entire ecosystems. It requires many educational activities which help people to understand the great importance of these changes. Education for sustainable development has become one of the most important factors which leads to an increase in the level of sustainability in local as well as in global meaning. According to the words of Nelson Mandela: "Education is the most powerful weapon which you can use to change the world."

The current, fifteenth issue of the journal "Studia Periegetica" is entirely devoted to the matters of education for sustainable development. It particularly focuses on research, practical implementation and educational solutions in the area of education for sustainable development applied in the Baltic Sea Region. Authors of the papers take into account academic activities, public administration entities and companies located in this region.

The content of this issue of the journal was divided into three sections: 1) theoretical and methodological problems, 2) studies and research works, 3) discussions, reviews and good practices. The first section consists of four articles. It opens with a paper by Agnieszka Dąbrowska entitled *Interdisciplinary as the key to efficient ESD: main benefits and challenges. Nanotechnology case study*. She discus-

ses interdisciplinarily the context of sustainability and possibilities of teaching. Nanotechnology is a good illustration in this instance as it provides good educational examples. Signe Bāliņa and Dace Baumgarte in the paper *E-learning for sustainable educational process*, draws readers' attention to the role of e-learning in contemporary educational processes. She puts forward the hypothesis, that dynamic and self-regulated e-learning can help in reaching the same learning results as traditional means of classroom training. Anna Bernaciak takes into consideration *The role of local authorities in education for sustainable development in Poland*. Her discussion is based on an example of Poznań City Hall. A paper prepared by Natalia Danilava refers to sustainable development in the economic sector. In the article *Sustainability management of industrial enterprise and assessment of its effectiveness*, she analyses the importance of the indicators characterizing the level of manageability and the growth level of organizational management structure.

The second set of papers is introduced by Olena Maksymetes' article. In the paper *Ukrainian forest sector competitiveness through incorporation of sustainable development aspects into MBA in forest-related industry program* she presents the outcomes of surveys concentrated on the aspects of sustainable development in the MBA courses. Andrey Nikishin discusses barriers and possibilities of developing wind energy in the region of Kaliningrad. In the paper *Wind for sustainable development as applied to the Kaliningrad region of Russia: technical aspects* he concludes that the future usage of new power plants in Kaliningrad can help to handle the problem of isolation in this part of Russia and its electrical energy system, as well as the decrease of CO_2 emission and the increase of the level of its sustainability. The article of Kristīne Bērziņa *Importance of the sectoral and regional cooperation network coverage for sustainable tourism development in Latvia* refers to the concept of sustainable tourism. On the basis of her article she analyses cooperation network sectorial and regional coverage importance for sustainable tourism in Latvia. Alona Revko focuses on human potential as the most valuable resource of any society (*The role of human potential for sustainable development in Chernihiv region, Ukraine*). She attempts to analyze the role of the potential for sustainable development.

The contributions within the third section describe various examples of good practices. They mainly derive from different universities located in the Baltic Sea Region (papers of Alla Pakina, Irina Puhachova, Kristīne Bērziņa and Ilze Mende). Nadiya Kostyuchenko and Denys Smolennikov present good practices from local communities. In turn, Sinnika Suomalainen describes the European project for education for sustainable development in higher education. Mikhail Nikishin, Daniil Krymov and Natalia Ivanova direct their research to possibilities for the use of electronic educational resources in maritime education.

I would like to thank all authors who contributed to this issue. I would like to address special thanks to the Secretary of the Baltic University Programme and to the director of the Programme – prof. Lars Ryden for helping with the release of the issue of "Studia Periegetica."

This is the first "Studia Periegetica" issue published entirely in English. I hope that it will greatly expend the scope of recipients of the journal.

I wholeheartedly believe that you will find this "Studia Periegetica" issue on Education for Sustainable Development to be an interesting and useful reference which will inspire your further studies and research in the field of education and sustainable development.

Enjoy the reading.

Arnold Bernaciak

Theoretical and Methodological Problems

Agnieszka Dąbrowska*

Interdisciplinarity as the Key to Efficient Education for Sustainable Development: Main Benefits and Challenges – A Nanotechnology Case Study

Abstract. Nowadays, one may observe a growing interest in sustainable development as the auspicious way to resolve global civilisation problems (www.undp.org). This leads to the increasing role of proper Education for Sustainable Development (ESD). Although there are many approaches to the strategy of efficient teaching (UNESCO 2012), in times of narrow specialization interdisciplinarity is frequently undervalued (Klein 1990). In this paper, the author brings attention to the question of interdisciplinarity in a broader context: its constantly changing definition, common ground with sustainability, main advantages of such a way of thinking, crucial difficulties, and hints aimed at how to introduce it to one's own teaching tools. As a case study, the teaching of nanotechnology (Meyer 2001) will be used to provide additional examples, share experiences, and make the connection between theory and practice. The aim is to disseminate the idea of interdisciplinarity as a key to efficient ESD in many domains.

Keywords: interdisciplinarity, ESD, teaching strategies, sustainable development, nanotechnology, new materials

1. Introduction and definitions: interdisciplinary versus sustainable

Looking back in time at the beginning of the concept of interdisciplinarity one may intuitively focus on the Renaissance period in the history of art and science. Although Leonardo da Vinci (Fig. 1) is the first, intuitive association, the multidisciplinary approach to life and science dates back to the Ancient Greece [Sam-

* University of Warsaw, Faculty of Chemistry, Laboratory of Nanomaterials Chemistry and Physics, e-mail: a.d.rumik@gmail.com, phone: +48 22 822 02 11.

bursky 1962]. First nature philosophers [Heller & Pabjan 2014], as distinct from their ancestors looking for practical solutions, were truly cross-disciplinary people seeking to understand the general roles of the whole Universe without dividing it in a spectrum of separated topics. They even used to submit empirical data to the paradigm of harmony and beauty [Platon 1986]. Although such a method is fortunately no longer valid, one should agree that it indisputably had one advantage. Taking a philosophical view of reality assured a holistic vision of the world as a conclusion of "scientific" delving [Arystoteles 1968]. To some extent, this inclusive approach was continued in the medieval Europe, however, only in the late Middle Ages, after an intellectual stagnation [Lindberg 1978]. Although first universities (*studium generale*) introduced different subjects [Wróblewski 2006], their aim was still to cover all up-to-date knowledge about the world and students' formation was based on the holistic vision. One might achieve it due to a logical program construction: first years dedicated to general formation (after the school *trivium* with logic and grammar, students moved on to the *quadrivium* based on arithmetic, geometry, astronomy, and music) and specialization (in medicine, theology, or law) for older students. To some extent the general base of this system is still used [Lepszy 1964]. Obviously, this is a very simplified picture as, even in the Middle Ages, the conception of education was not homogenous at different levels and in different parts of Europe. One may find it interesting that from two dominating types of universities, the Paris and the Bologna, the first one dominated in many more regions. Within the second system, the professors' rights were limited and their position rather insignificant: rich students could even judge and punish them for inadequate behaviour during classes [Moulin 2002]. Among the major drawbacks of this type of organization one may point out: low efficiency (on average only one in four students finished the first three years of education and just one out of twenty reached the master level), small number of students, and long education (even more than 8 years to obtain the doctoral title in theology). Despite the above-mentioned problems, that was the last moment in history when all educated people had the same background, which is the key factor in interdisciplinary communication.

During centuries, as the number of discovered facts and laws of nature increased, first attempts at specialization had to be introduced. After the Renaissance model of broad and interdisciplinary education, the Enlightenment started to create more one-discipline specialists than multidiscipline general knowledge masters. That was directly related to the new discoveries and enabled an even faster growth in particular disciplines: physics, medicine, natural science. This tendency, together with the growing number of students due to mass education, caused, at the end of 20th century, separation of knowledge into many different disciplines. Although the majority would agree with Richard Feynman, who claimed that "we may divide sciences into chemistry, physics, mathematics, and

Figure 1. Leonardo da Vinci (15 IV 1452 – 2 V 1519) is seen by many as the interdisciplinarity icon; however, this symbol may be a bit too schematic for proper understanding of the term "interdisciplinary"; the "foggy" picture of the wax figure of the "master"

Source: Wax Museum in Rome – Museo delle Cere (photo by A.D. Rumik).

geography, but Nature does not know anything about it," the problem of how to integrate all wide knowledge in one subject accessible for a single human being remains unsolved. What is even more alarming is the enlarging gap between human and natural science. Among other factors (fast expanding facts resources, thousands of new papers published every day, sophisticated and detailed "theories on the edge") the jargon often disables any communication between specialists working in different fields. It occurs sometimes even if the subjects of their scientific investigations remain the same. For spectacular success of modern technologies and growing life standard, the price of losing the holistic vision of the world and humanity is to be paid. Is that really inevitable?

In the 20th and 21st century, the growing awareness of the above-mentioned problems developed parallel to the revolution in information management [Gleick 2012] and common understanding of transgressing planetary boundaries [Rockström et al. 2009]. The lack of balance needs to be addressed. As a consequence, one may observe a growing interest in sustainable development postulates. All of them, promoting mature and responsible approach to the future of our planet and civilisation, are in perfect agreement with the vision of a citizen having interdisciplinary education. Considering the factors that caused narrow specialization during history, it is apparent that the return to the Renaissance model is no longer

possible (for instance due to the limited life span of humans that is far below the time needed to acquire all known scientific wisdoms). On the other hand, nowadays, because of significant progress in understanding and processing of information [Shannon 1993], some new solutions and opportunities are available. Easy access to facts via internet and facilitated information distribution and communication methods allow for faster and more efficient knowledge building together with cooperative team working. Instead of being a "walking encyclopedia" of collected and memorized facts one may dedicate time to properly integrate information, create links and, in a critical and creative way, filter data not memorized but taken from outer sources. The so-called "people bridges" help to facilitate cooperation between world leading specialists and create models for a fruitful life in the episodic modern world. They are necessary to realize the most important "sustainable wishes" as terms and conditions of sustainable development require a holistic approach to humans and their environment, underlining the connection between each single action and decision. On the other hand, the new visible trend stressed in publishing and in project design, the "interdisciplinary approach" in research, is in many cases just traditional work of many experts brought together without any particular conceptual integration of different disciplines. There are also numerous attempts to quantitatively describe this phenomenon [Morillo 2001]. As proper, conscious interdisciplinary teaching is not to be undervalued in creating open-minded scientists, let us now examine this topic more extensively.

2. Key concepts and case study (introduction to nanotechnology): from theory to practice

Before discussing interdisciplinarity as the key to efficient ESD, it is worth unscrambling and clarifying related notions. One may distinguish (according to any dictionary, e.g. Collins or Webster):

– crossdisciplinary (viewing one subject from the standpoint of another),
– multidisciplinary (the combination of several content areas that are concerned with one problem, but without intentional integration),
– plurdisciplinary (the combination of related content areas, e.g. math and physics),
– transdisciplinary (beyond the scope of the disciplines; to start with the problem and bring to bear knowledge from the disciplines),
– curriculum integration / thematic teaching (terms used to describe teaching methods that include interdisciplinary studies),
and finally:

– interdisciplinary (combining or involving two or more academic disciplines or fields of study).

What is crucial in the interdisciplinary approach to any topic is the ability to view the problem from different perspectives, discuss various points of view, widen horizons, introduce a broad context, perceive complexity and the system as a whole; awareness of action consequences and responsibility, deep understanding of the process, and efficient purpose realization are also of importance. In interdisciplinary teaching methods, achievements, reasoning, and language from more than one academic discipline might be used. In this type of learning the additional value is gained since the final effect go beyond the sum of components. The aim is to create connections and enable observation of new phenomena. It is also a homocentric way of studying. Assuming that the sustainable development implementation would be the aim, interdisciplinarity might enlarge efficiency of dealing with various tasks.

Taking all that into account, the suggestions for efficient ESD would be the following:

– Providing examples from different disciplines,
– discussing problems from various points of view,
– making consultations with experts from many fields,
– working on sources taken not only from SD materials,
– using blended teaching,
– studying various cases (both from different disciplines and one particular done by experts with diversified backgrounds),
– encouraging students to gain general knowledge of disciplines far related to their professional domain of interest,
– training in information selection,
– creating links between disciplines (with proper jargon translation),
– stimulating interests,
– basing on peer reviews and student-to-student teaching,
– organizing debates of representatives of human science together with natural science,
– teaching the basics of efficient communication [Peters 1999], information management, and knowledge creation [Sunstein 2006].

To better illustrate those ideas let us consider for a moment a concrete teaching subject: nanotechnology. It is a valid example because of its huge, and still growing, importance in modern society [Roco et al. 2002]. This science on the edge was truly interdisciplinary from the very beginning, combining chemistry, physics, material engineering, technology, biology, and others. Initially broadly-based it subsequently split into a set of narrow, specialised fields [Schummer 2004]. What was characteristic was rediscovering and reusing known concepts but in a new context. On the one hand, there are currently very few branches to
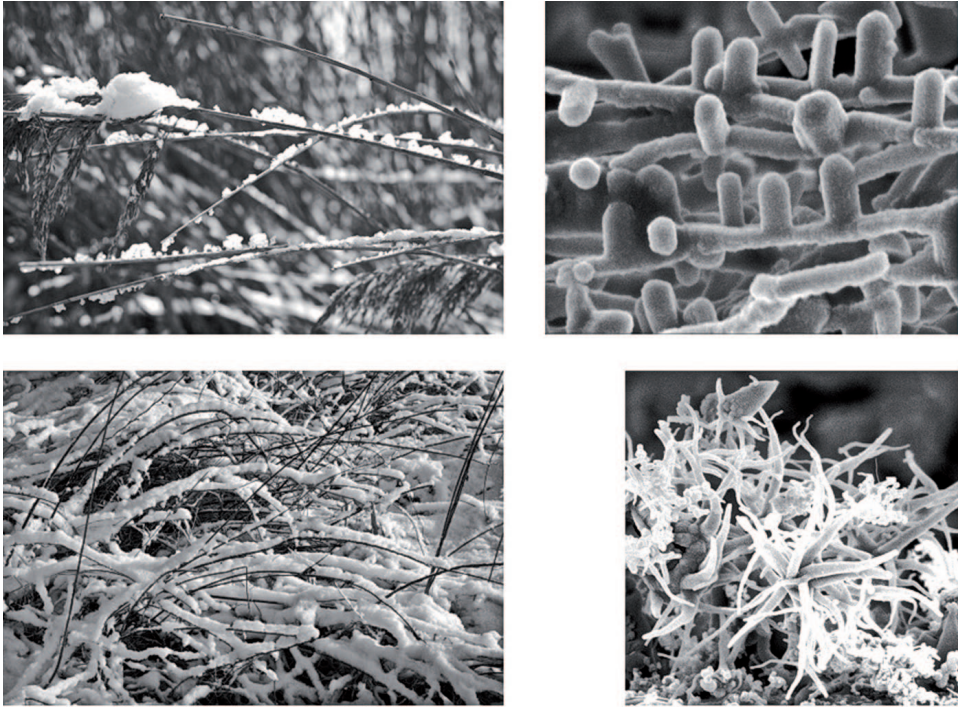
Figure 2. The relationship between natural inspiration (on the left, fresh snow on branches) and nanomaterials (on the right, SiC nanocombs and modified SiC nanowires); the ability to perceive analogies is one of the main benefits of interdisciplinary training

Source: SEM from University of Warsaw (photo by A.D.Rumik).

develop as fast and dynamically as nanotechnology, on the other, fringe opinions about "nano" may be observed among non-specialist. There is still a lack of common knowledge about the possibilities and drawbacks of nanotechnology. Huge enthusiasm from the business perspective results in mass production of nanomaterials without regard to future consequences: their potentially significant impact on the environment (the majority of waste sooner or later ends in the sea) and human health. At the other end of the spectrum, there are suggestions to abolish and be wary of everything that is (or may be) "nano" without precisely defining and understanding what it is. Both approaches, as completely neither sustainable nor balanced, are not recommendable. There is a strong need for conscious and well-designed strategy of future development of nanomaterials based on the people's awareness and real needs. To make it efficient, education of society is crucial. What about specialists? Let us imagine a scenario in which a leading nanotechnologist would be concurrently a sustainable development aware person. It is not

a utopia since education will provide physical chemists with examples from other disciplines. The open task how to use nanotechnology for solving global problems should be introduced. As a result, nature might be the best inspiration for materials design and engineering. Biomimetics is a successful example [Raz 2013].

Finally, nanotechnology is even more related to the idea of sustainable development than one may presume. In this place it is worth mentioning the Sustainable Nanotechnology Organization (SNO) that, as written on their website: "is a non-profit, worldwide professional society comprised of individuals and institutions that are engaged in:

– Research and development of sustainable nanotechnology,
– implications of nanotechnology for environment, health, and safety,
– advances in nanoscience, methods, protocols, and metrology,
– education and understanding of sustainable nanotechnology,
– applications of nanotechnology for sustainability,

SNO's purpose is to provide a professional society forum to advance knowledge in all aspects of sustainable nanotechnology, including both applications and implications, societal and economic aspects."[1] This example illustrates a cross-disciplinary action worth promoting. There are also many information centres and educational initiatives[2] with valuable training materials to be found.[3]

3. Challenges and drawbacks

Although the list of benefits seems meaningful, interdisciplinary teaching is not a trivial task. In modern society strong demand for specialists, absolute experts in a narrow domain is constantly increasing. Economic reasons will dominate. As a consequence, interdisciplinary teaching, giving broad and extended background to the "practical tools," may encounter strong opposition from market- and success-oriented students. Additional requirements and necessary effort may, at the first sight, seem redundant and too time-consuming. This obstacle is easier to overcome in the case of commercial courses and training programs for adults, where consciousness of the importance of long-lasting results instead of an imminent, superficial effect is observed in people investing in their life-long education. In both cases one may also base on the innate human curiosity stimulating interests and hobbies. Moreover, fast developing tutoring [Czekierda 2015] and mentoring tools might be useful in creating multidimensional and long-lasting professor-student relationships, which are so indispensable for interdisciplinary

---

[1] www.susnano.org/index.html [15.01.2016].
[2] www.nanotechproject.org [15.01.2016].
[3] www.nanohub.org/groups/gng/training_materials [15.01.2016].

education. Another challenge is related to teachers' efforts as they have to be at least doubly well-prepared. In addition, they will need to keep their knowledge of various disciplines up-to-date, which, in view of the rapidly growing number of published papers, may seem a "mission impossible". Here the key would be proper content selection. Links between domains are also fruitful. Information integration, despite the jargon and specific tools, and common practices typical for each field, is possible. Reference to experts can always be made. There is always an optimum number of people that may teach a subject together from different perspectives. Finally, one has to bear in mind that interdisciplinary is not a synonym of chaotic – a purpose-driven approach should always be maintained in order not to get lost in variety.

4. Conclusion and final remarks

Taking into account all advantages, positive feedback and, especially, long-term benefits of interdisciplinarity, one may conclude that, despite all numerous challenges, it is worth teaching further generations in that manner: widening horizons, presenting problems from different perspectives, and creating a holistic vision of the world. As the theme is far too broad for one introductive article, the variety of up-to-date literature might be helpful [Andersen 2016; Foley 2016; Pittman 2016; Urea 2015]. Individual predispositions are needed and, initially, a lack of support and understanding due to the inertia of the system must be overcome, but sustainable goals, as Rome, "are not built in a day."

References

Andersen H., 2016, Collaboration, interdisciplinarity, and the epistemology of contemporary science, *Studies in History and Philosophy of Science*, Part A, vol. 56: 1-10.

Arystoteles, 1968, *Fizyka*, Polish translation: K. Leśniak, Warszawa: PWN.

Czekierda P., Fingas B., Szala M., 2015, *Tutoring. Teoria, praktyka, studia przypadków*, Warszawa: Wolters Kluwer Polska.

Foley G., 2016, Reflections on interdisciplinarity and teaching chemical engineering on an interdisciplinary degree programme in biotechnology, *Education for Chemical Engineers*, vol. 14: 35-42.

Gleick J., 2012, *Informacja. Bit, wszechświat, rewolucja*, Kraków: Znak.

Heller M., Pabjan T., 2014, *Elementy filozofii przyrody*, Kraków: Copernicus Center Press.

Klein J.Th., 1990, *Interdisciplinarity. History, Theory & Practice*, Detroit: Wayne State University Press.

Lepszy K., 1964, *Dzieje Uniwersytetu Jagiellońskiego w latach 1364-1764*, t. 1, Kraków: PWN.

Lindberg D.C., 1978, *Science in the Middle Ages*, Chicago: University of Chicago Press.

Meyer M., 2001, Patent citations in a novel field of technology: An exploration of nano-science and nano-technology, *Scientometrics*, vol. 51: 163-183.

Morillo F. et al., 2001, An approach to interdisciplinarity through bibliometric indicators, *Scientometrics*, vol. 51: 203-222.

Moulin L., 2002, *Średniowieczni szkolarze i ich mistrzowie*, Polish translation: H. Lubicz-Trawkowska, Gdańsk – Warszawa: Marabut.

Peters J.D., 1999, *Speaking Into the Air. A History of the Idea of Communication*, Chicago: University of Chicago Press.

Pittman J. et al., 2016, The evolution of interdisciplinarity over 20 years of global change research by the IAI, *Current Opinion in Environmental Sustainability*, vol. 19: 87-93.

Platon, 1986, *Timajos, Kritias albo Atlantyk*, Polish translation: P. Siwek, Warszawa: PWN.

Raz J., 2013, *Biomimetics*, Berlin: Walter de Gruyter.

Rockström J. et al., 2009, Planetary Boundaries: Exploring the Safe Operating Space for Humanity, *Ecology and Society*, vol. 14(2): 32.

Roco M.C. et al., 2002, *Converging Technologies for Improving Human Performance: Nano-technology, biotechnology, Information Technology and cognitive Science*, Arlington, VA: National Science Foundation.

Sambursky S., 1962, *The Physical World of Greeks*, New York: Collier Books.

Shannon C.E., 1993, *Collected Papers*, New York: Oxford University Press.

Schummer J., Multidisciplinarity, interdisciplinarity and patterns of research collaboraton in nanoscience and nanotechnology, *Scientometrics*, vol. 59(3): 425-465.

Sunstein C.R., 2006, *Infotropia. How Many Minds Produce Knowledge*, Oxford: Oxford University Press.

UNESCO, 2012, *Education for Sustainable Development. Sourcebook*, Paris.

Urea R., 2015, The Perceived Significances of Interdisciplinarity at Students in Educational Sciences, *Procedia-Social and Behavioral Sciences*, vol. 187: 228-233.

Webster Dictionary, 1993, Cologna: Könemann.

Wróblewski A.K., 2006, *Historia fizyki*, Warszawa: WN PWN.

www.nanohub.org/groups/gng/training_materials [15.01.2016].

www.nanotechproject.org [15.01.2016].

www.susnano.org/index.html [15.01.2016].

www.undp.org [15.01.2016].

Interdyscyplinarne podejście
jako klucz do efektywnego przekazywania wiedzy
zgodnie z koncepcją zrównoważonego rozwoju:
korzyści, wyzwania oraz analiza zagadnienia
na przykładzie nauczania nanotechnologii

Streszczenie. Obserwowany współcześnie wzrost zainteresowania koncepcjami zrównoważonego rozwoju wynika z pokładanych w nich nadziei przy rozwiązywaniu globalnych problemów cywilizacyjnych. Związana jest z tym konieczność wypracowania właściwych metod nauczania, które służyłyby wdrażaniu głównych postulatów zgodnie z założeniami zrównoważonego rozwoju. Wśród wielu podejść na uwagę zasługuje interdyscyplinarność, często niedoceniana we współczesnym świecie słynącym z wąskich specjalizacji. W artykule tym zajmujemy się w szerszym kontekście tym zagadnieniem: rozważając ewolucję interdyscyplinarności na przestrzeni stuleci, jej zbieżność z pojęciem zrównoważenia oraz główne korzyści i problemy związane z interdyscyplinarnym nauczaniem. Konkretne wskazówki i rozwiązania zostaną przedstawione na przykładzie nanotechnologii – nowoczesnej dziedziny czerpiącej z wielu dyscyplin naukowych. Celem jest rozpowszechnienie koncepcji interdyscyplinarnego nauczania jako pełnej i zgodnej z założeniami zrównoważonego rozwoju edukacji specjalistów z różnych dziedzin.

Słowa kluczowe: interdyscyplinarny, zrównoważony rozwój, techniki nauczania, nanotechnologia, inżynieria materiałowa

Signe Bāliņa*, Dace Baumgarte**

E-learning
for Sustainable Educational Process

Abstract. This paper gives an overview of the skills that are necessary in our century and provides a hypothesis that a dynamic and self-regulated e-learning system can help reach the same learning outcomes as the means of traditional classroom training. The paper emphasises the role of analogical thinking within the context of 21st century learning. It is also argued that effective e-learning comprises of individual learning, learning by collaboration, and learning in a real world environment which motivates learners to use e-learning materials independently, and, at the same time, provides a dynamic and collaborative learning process. Two case studies provide practical examples for proving the viewpoint that e-learning can provide successful learning outcomes if specific factors are taken into account.

Keywords: e-learning, blended learning, collaboration, information and communication technologies, skills

1. Introduction

At the time when rapidly changing information and communication technologies (ICT) influence all spheres of our life, also the need for acquiring new skills and knowledge for professional and everyday life increases. Nowadays individuals find themselves in the situation of constant learning in order to fully participate in the society. Digital skills are necessary competences for the majority of fields and professions. These circumstances along with the information overload

* University of Latvia, Faculty of Economics and Management, e-mail: signe.balina@lu.lv, phone: +371 292 523 65.

** Doctoral student at University of Latvia, Faculty of Economics and Management, e-mail: dace.baumgarte@gmail.com, phone: +371 294 960 38.

and constantly growing competition require immediate interdisciplinary knowledge and ability to orient oneself in various branches.

Thus, life-long learning has become a necessity for adults, and the problem emerges about the most appropriate learning forms and methods. The learners need time for acquisition of new knowledge and obtaining new skills, and it creates an additional workload [Karjalainen, Alha & Jutila 2006].

ICT can help organize the learning process in a way that the balance can be found between time for the acquisition of new knowledge and workload. Likewise, by means of e-learning it could be possible to achieve as good results as by traditional academic learning, especially considering the advantages of e-learning – flexibility of changing the content and sustaining it up-to-date, the opportunities of providing demonstrations and simulations, as well as the availability at any time and at any place [Hubbard 2013]. If compared to traditional learning, there is still an ongoing process for establishing the best possible combination of the opportunities provided by the latest technologies with pedagogically grounded methods both for individual and group work so that learners would not lose their motivation and the education could be with long-term contribution.

The purpose of the research is to find out the specific factors that provide successful e-learning outcomes and sustain learners' motivation. The hypothesis of the research is that these factors are constant feedback, support, mutual collaboration and learning activities with group mates, and communication with instructor/trainer using ICT.

2. Learning in 21st century

Nowadays, the technologies change our life by demanding the constant acquirement of new knowledge and skills, as well as by changing the process of learning. As it is indicated in the plan of action "Transforming our World: The 2030 Agenda for Sustainable Development" by United Nations, one of the goals is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. This includes the challenge that by 2030 it is substantially necessary to increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. Another goal of the plan defines the necessity to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. The challenge is to achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors [United Nations 2015].

Within the context of learning, digital economy and sustainable development require people with digital skills, an open mind and critical thinking in order to fully participate in modern society and economy.

"Traditional unidirectional educational processes are only of very limited use when educating for sustainable development: firstly, the initial state of the considered system (case) cannot be described precisely; secondly, the target state of the system is also not sufficiently known; and thirdly, the process between initial state and target state and potential barriers that might have to be passed are also not exactly known. Pure analytically based solutions are therefore, not available; a dynamic mutual learning process is required instead. Mutual learning based on real-world cases requires an interdisciplinary point of view, transdisciplinary problem-solving processes, and self-regulated and self-responsible learning. Consequently, besides analytical capabilities and deterministic process planning, dealing with the complex problem of sustainable development requires creativity, social competencies and specific communication skills in order to cope with the dynamic change that characterizes the developments in most facets of society and nature" [Steiner & Posch 2005].

These skills are also defined in the Framework for 21st Century Learning, determining that the following skills should be ensured by a learning process in 21st century:

"– creativity and innovation,
– critical thinking and problem-solving,
– communication and collaboration" [Framework for 21st Century Learning 2011].

As Philip Johnson-Laird states about the mental models, "the most urgent demands for the twenty-first century are the extension of the theory to problem solving, decision making and strategic thinking when individuals compete or co-operate" [Johnson-Laird 2005: 203].

This situation requires a learning process and methods that are not entirely based on memorizing but largely consist of development of skills, promoting comprehension and discernment.

3. Analogical thinking
for 21st century education's needs

The process of distinguishing and noticing the similarities and analogies can be one of the mechanisms by means of which the 21st century education needs can be reached. This can help acquire the skills for critical thinking, problem-solving and using knowledge and information in new contexts.

Generally, the experience and accumulated knowledge helps people orient themselves in new situations, make decisions and solve the problems. The knowledge is used in the process of thinking through the three types of reasoning – deduction, induction, abduction, by seeking for similarities and differences to deal with similar problem situations [Johnson-Laird 1999]. There are three phases in any training – actualization of previous, apprehension of new, and usage of gained knowledge and skills. The middle phase – is the one that helps learners integrate the new knowledge into their experience. Therefore, it is important to provide the opportunity in this phase to experiment, to express ideas and figure out where the new skills or knowledge can be used [Namsone 2010].

At the 10th International Symposium of Cognition, Logic and Communication "Perspectives on Spatial Cognition", Professor Dedre Gentner in her keynote lecture at University of Latvia expressed an opinion that the creation of analogies is a powerful learning process where abstract knowledge forms on the basis of experience. In more than 30 years of research she has discovered the principles by which the comparing processes take place in the psyche of children and adults. The scientist considers that structure mapping is based on revealing common relations across systems and common structure, drawing conclusions and revealing the differences between situations. Emphasising that by analogy is meant the structure of common relations or relationships, but not common specific characteristics/features [Gentner 2014]. As stated by L.E. Richland and N. Simms, there is also the model developed for teaching with analogies that is recommended for teachers. This model defines 6 consecutive steps for how to teach with the help of analogies – to "introduce the target concept, review the analog concept, identify relevant features of the target and analogy, map similarities, indicate where the analogy breaks down, and draw conclusions" [Richland & Simms 2015].

Thus, the aim of the learning process is to help learners understand the principles of some phenomenon, action, or situation, and not only perceive the differences in features. This analogical thinking could be facilitated by providing such learning tasks that allow learners to find similarities, decipher differences, and classify according to the found similarities. It could be argued that if a learner has wider experience for finding similarities and classifying, then it is easier to integrate new information in other context by allocation it to a new situation.

4. E-learning as a form of 21st century education

The results of J. Swaak and T. de Jong [2001] research, that are graphically presented in Figure 1, show that the best possible results of learning are achieved if

```
┌──────────────────────────────────┐        ┌──────────────────────────────────┐
│  Individual learning (self-learning)  │        │  Learning by collaborating  │
└──────────────────────────────────┘        └──────────────────────────────────┘
                    ↖                                  ↗
                individual                          social
                         ┌──────────────────┐
                         │    Knowledge     │
                         └──────────────────┘
                                 │
                             contextual
                                 ↓
                  ┌──────────────────────────────────┐
                  │  Learning in a real world environment  │
                  └──────────────────────────────────┘
```
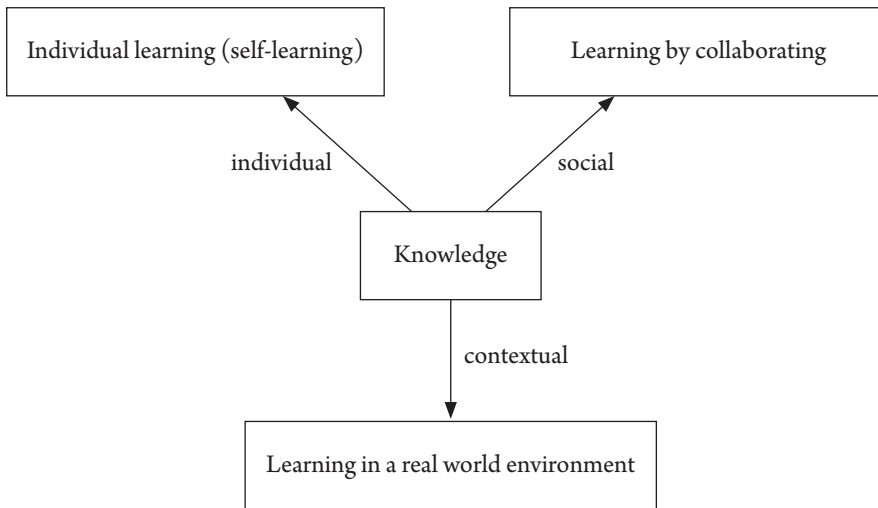
Figure 1. Three ways of getting the knowledge in accordance with the research carried out

Source: Swaak & Jong 2001.

learning involves three types of getting knowledge – individual learning, learning by collaboration, and learning in a real world environment. All these components can be provided by means of e-learning.

E-learning can be a useful medium also for acquiring the 21st century skills in a sense that it is formed on the basis of ICT, it is a digital media using digital tools and requiring digital skills [Hubbard 2013].

"Interaction between learners and teachers needs to be organized in a way that directly generates a demand for learning in the sense of mutually searching for the meaning of the concept of sustainability both for the individual and for the systems in which they are embedded. The following principles for higher education for sustainability, i.e. interdisciplinarity, transdisciplinarity, and self-regulated learning, are a result of these requirements" [Steiner & Posch 2005].

Although e-learning is a self-regulated process based on each learner's individual pace and needs, it still remains to be a process that requires support. This support in e-learning can be provided by tutor/instructor and by other participants of e-learning [Ghirardini 2011].

As G. Steiner and A. Posch states, by providing the real world cases and communication and collaboration for mutual learning, the process becomes dynamic. For example, "students experience the process of sustainable development instead of purely memorizing its characteristics. The process of educating for sustainable development and practical applied sustainability therefore, becomes sustainable" [Steiner & Posch 2005].

The same principles can be applied when using e-learning as a platform and as a tool. Thus by acquiring new learning tools via e-learning the learning process itself becomes sustainable.

As stated by B. Ghirardini, within the context of availability of ICT tools, e-learning materials gain their usefulness if designed accordingly to the principles that determine their quality:

"– learner-oriented content: e-curricula should be adequate and specifically oriented on learners' needs, roles and responsibilities in their professional activities;

– the granularity: e-learning materials must be segmented for more successful acquisition of new knowledge and for the flexibility of planning the time for training;

– captivating content: teaching methods and forms to be used creatively for the learning experience to be exciting and motivating;

– interactivity: frequent learner's involvement/interaction is necessary in order to keep learner's attention and facilitate the acquisition;

– personalization: self-regulating learning materials should be adjustable to student's interests and needs" [Ghirardini 2011: 14].

To achieve a balance in efficient, effective and culturally correct learning, Julie Wedgwood suggests using "a combination of learning strategies and delivery media" [Wedgwood 2013: 91]. J. Wedgwood argues that "blended learning is not about providing a linear route to capability. It is about providing multiple routes, fostering the beginning of learner control over their own learning journey and uses multiple communication technologies embedded in the workflow" [Wedgwood 2013: 95].

Thus in order to ensure an effective e-learning that motivates learners to use e-learning materials independently without trainer's or teacher's participation, and at the same time providing dynamic and collaborative learning process, it is advised to transfer the traditional learning methods to e-learning by means of ICT. Therefore, the following e-learning methodological principles can be proposed for self-regulated learning, for collaboration and communication, and for learning in a real world environment.

For self-regulated learning the classroom lectures can be transferred as synchronous or asynchronous video or audio lectures, as real environmental demonstrations, or as electronic documents, presentations and interactive materials. On-site demonstrations or laboratory works can be organized within the specifically created environment of simulations.

The traditional learning dialogical methods, such as conversations, discussions, "brainstorming", dialogues, and role-games can be transferred to e-learning as asynchronous communication by means of e-mail, forums, blog, audio and video podcasts, and wiki pages. Synchronous communication can be provided

using instant messaging, chat, audio and video conferencing, and online seminars (webinars).

By involving learners in mutual activities, for example, in online discussions or organising group work for solving problems, performing tasks and handing in the results jointly, learners implicitly mutually support and inspire each other. Comments and sharing of ideas in forums can help deeper understand the subject matter and improve the knowledge. Likewise, the mutual collaboration facilitates the learners' engagement in e-learning environment, and that consequently increases the possibility for the learning to be finished, i.e., the learner will not drop out or leave the learning.

Meanwhile, the traditional learning in a real world environment can be transferred as podcasts for the task assignment and receiving the results.

Thus, e-learning implicitly allows to acquire new practical skills and new way of collaboration and communication during the learning process in a real-world situation and in a digital environment.

5. Case studies

The two case studies of online study projects for school teachers proves the theoretical ground that e-learning can provide successful learning and active participation. This involvement can be achieved if e-learning incorporates self-regulated learning, learning by collaboration, and learning in a real-world environment, i.e., if it consists of such components as individual, social and contextual learning.

Moreover, these case studies show a good example how teachers not only learn the usage of ICT tools, but empirically get acquainted with new teaching methods in their own learning process that can be used at schools for teaching their students.

5.1. The project "Trans e-Facilitator"

The international project "Trans e-Facilitator" was carried out in Latvia, Germany, Portugal in year 2014.[1] It was a modular training for facilitators of digital competences ("e-facilitators") and it was based on a set of learning modules that were adapted to specific national needs. These needs had been identified in national surveys analysing e-facilitators' tasks and competence gaps. The target group in Latvia consisted of teachers and librarians. The duration of the learning process was four weeks and it was organised as a blended learning – the first face-to-face

---

[1] www.trans-efacilitator.eu/content/sections/ [16.11.2015].

introductory seminar, individual learning in Moodle environment for four weeks and a closure face-to-face seminar. During the study process participants individually studied the theoretical material uploaded in Moodle environment, took part in discussion forums, completed and uploaded weekly assignments for grading, as well as took self-evaluation test with 5 questions at the end of each module. It was required also to take the final test that consisted of 20 questions. At the final face-to-face seminar participants shared their experience and gave feedback about the learning process, their progress and assignments.

During the study process the positive activity of participants was observed. All participants finished the online training with the following results: 73% of participants fully completed the training material and handed in all assignments (10% of participants performed 25% of the requirements, 17% of participants – 75%). 90% of participants completed the final test and 73% of participants received the certificate of a successful completion of the e-learning content.

5.2. The project "Online4EDU"

The objectives of the project "Online4EDU", taking place from January till April, 2016, are to support teachers in applying more digital media in everyday school life, to design and test blended learning concept that facilitates online collaboration tools for school teachers of primary, lower and upper secondary and vocational schools, to extend the use of intergenerational learning and digital competences training, and to prepare teachers for the ECDL Online Collaboration certification test.[2]

The target group's training takes place in four European countries: Germany, Estonia, Latvia, and Lithuania.

The training is in a form that blends the first and final face-to-face meetings and individual and group work in Moodle environment. The covering of learning material consists of 3 Modules for reading the theoretical part and carrying out self-assessment tests, completing and handing in individual and group tasks and final project presentation. Tasks are evaluated by trainers of the project. Participants are expected to participate actively in forum, participate in monthly webinars and complete the necessary tasks. The learning process is supervised by the project's trainers by giving feedback, communicating with participants and supporting them. If the previously mentioned tasks are completed, the participants (teachers) will be allowed to take the ECDL test which is mandatory. In case of a positive result, the ECDL certificate will be issued to the teacher.

---

[2] www.online4edu.eu/ [16.11.2015].

Although the project's requirement is that at least 30 teachers from Latvia are involved in the training process, there are 34 teachers participating from Latvia, who already actively participate in the online training.

At the end of the Module 1, almost 90% of participants joined the online meeting. None of the participants has dropped out or left the e-learning in Module 1. All participants actively complete and hand in (upload in Moodle environment) the tasks and cooperate in group works.

The key factors for successful outcomes of the projects and for motivation of participants were a constant feedback, support, mutual collaboration with group mates and communication with instructor/trainer.

6. Conclusion

All the methods and principles in this paper are given from the pedagogical point of view, however, in order to choose the most appropriate methods and tools also the technological aspect should be taken into account as well as digital skills of learners. The e-learning can help fill the gap of dynamic at the same time self-regulated learning that the unidirectional education lacks within the context of nowadays needs for sustainable education. E-learning helps balance time for the acquisition of new knowledge and workload.

As case studies show, by means of professionally and pedagogically grounded e-learning it is possible to reach the learning objectives if it incorporates self-regulated learning, learning by collaboration, and learning in a real-world environment. Also, the experience gained during the learning can be transferred and used in real life situations if analogical thinking, identification of similarities and critical thinking is applied and forms a basis for problem-solving and creativity.

The hypothesis of the research by means of both case studies is proven that providing such specific elements as constant feedback, support, mutual collaboration and learning activities with group mates, and communication with instructor/trainer using ICT, the successful e-learning outcomes and sustain learners' motivation can be reached.

References

Framework for 21st Century Learning. Partnership for 21st Century Skills, 03/2011, www.p21.org/about-us/p21-framework [16.11.2015].

Gentner D., 2014, Keynote lecture "Comparison and relational language in the development of relational categories" in 10th International Symposium of Cognition, Logic and Communication "Perspectives on Spatial Cognition," University of Latvia, www.lu.lv/zinas/t/29126/, http://cognition.lu.lv/symp/10-call.html [16.11.2015].

Ghirardini B. (ed.), 2011, A guide for designing and developing e-learning courses, *E-learning methodologies*, FAO.

Hubbard R. (ed.), 2013, *The Really Useful eLearning Instruction Manual*, London: Wiley & Sons.

Johnson-Laird P.N., 1999, Deductive Reasoning, *Annual Review of Psychology*, 50: 109-135, www.cogsci.ucsd.edu/~coulson/203/johnson-laird.pdf [16.11.2015].

Johnson-Laird P.N., 2005, Mental models and thought, in: *The Cambridge Handbook of thinking and Reasoning*, eds. K.J. Holyoak, R.G. Morrison, Cambridge: Cambridge University Press.

Karjalainen A., Alha K., Jutila S., 2006, *Give Me Time to Think. Determining Student Workload in Higher Education*, Oulu: Oulu University Press.

Namsone D., 2010, Dabaszinātnes skolā – atbilstoši laikam: dabaszinātņu didaktika skolā, Lielvārde: Lielvārds, in: R. Birziņa, *Bioloģijas mācību stunda. 1.1. Mācību stundas plānošana*, Latvijas Universitāte, http://profizgl.lu.lv/mod/book/view.php?id=20423&chapterid=5159 [16.11.2015].

Richland L.E., Simms N., 2015, Analogy, higher order thinking, and education, *Wires Cogn Sci*, doi: 10.1002/wcs.1336, http://learninglab.uchicago.edu/Publications_files/Richland_Simms_2015%20%282%29.pdf [16.11.2015].

Steiner G., Posch A., 2005, Higher education for sustainability by means of transdisciplinary case studies: an innovative approach for solving complex, real-world problems, *Journal of Cleaner Production*, 14: 877-890, www.sciencedirect.com [16.11.2015].

Swaak J., Jong T. de, 2001, Discovery simulations and the assessment of intuitive knowledge, *Journal of Computer Assisted Learning*, 17: 284-294.

United Nations, 2015, *Transforming our World: The 2030 Agenda for Sustainable Development*, https://sustainabledevelopment.un.org/post2015/transformingourworld/publication [16.11.2015].

Wedgwood J., 2013, Blended Learning, in: *The Really Useful eLearning Instruction Manual*, ed. R. Hubbard, London: Wiley & Sons.

E-learning na rzecz zrównoważonego procesu dydaktycznego

Streszczenie. Artykuł omawia umiejętności, których wymaga życie w XXI wieku oraz zakłada, że dynamiczny i samoregulowany e-learning pozwala na osiągnięcie podobnych wyników nauczania jak tradycyjna nauka w sali zajęciowej. Podkreśla również rolę analogicznego myślenia w kontekście uczenia się w XXI wieku. Wskazuje ponadto, że skuteczny e-learning, który łączy naukę indywidualną z nauką poprzez współpracę i nauką w środowisku rzeczywistym, motywuje uczącego się do samodzielnego korzystania z materiałów dostępnych online, a przy tym zapewnia odpowiednią dynamikę i poziom współpracy w ramach procesu. Za pomocą dwóch studiów przypadków ilustruje, jak odbywa się to w praktyce, dowodząc, że e-learning może przynosić zadowalające efekty, jeżeli tylko wzięte zostaną pod uwagę określone czynniki.

Słowa kluczowe: e-learning, blended learning, współpraca, technologie informacyjne i komunikacyjne, umiejętności

Anna Bernaciak*

The Role of Local Authorities in Education for Sustainable Development in Poland

Abstract. Educational activities are the foundation of sustainable development. Educating the public in the field of ecological behaviour makes it possible to change the behaviour perceived as negative by other members of society and then slowly replace it with one that is acceptable and well regarded. Developing the correct attitudes in a society means that such attitudes will be obvious and natural for the next generations. This would lead to changes in the behaviour of residents and, thereby, help reduce their negative impact on the environment. A special role is played by local government units in this process, including primarily, the municipality. In carrying out their own tasks they fulfil the demands of education for sustainable development directly and indirectly. A direct impact manifests itself in educational activities, promotions, and other activities affecting the environmental awareness of residents. Indirect activities arise from the fact that local government units fulfil their own tasks in the field of environmental protection, urban planning, or investments. Using these channels, the authorities at the municipal level can influence residents and other stakeholders through encouraging them to present desired behaviours through moulding appropriate attitudes and promoting specific patterns. The main purpose of this article is to point out the role of local authorities in education for sustainable development (ESD) and give a few examples of individual activities. At the same time, an attempt is made to distinguish the main areas of activities in ESD at the local level.

Keywords: education for sustainable development, local government, effectiveness, management

1. Introduction

The tasks of a local government at the municipal level in Poland mainly result from legal regulations. The Act on Municipal Government defines a catalogue of

* Poznan University of Economics and Business, Faculty of Management, e-mail, anna.bernaciak @ue.poznan.pl, phone: +48 61 854 31 26.

the basic activities of the municipal authorities, while detailed provisions state how these activities should be performed. These regulations are very specific as regards activities related with investments or urban planning. Procedures are described, as well as protocols and task hierarchy. However, no specific operating guidelines exist for promotional and educational activities. Consequently, their scope and nature are much diverse in individual local government units. Municipalities show extremely different levels of activity in the area of the so-called soft actions. Some local authorities take a stand that these tasks are fulfilled by educational centres within each municipality, and the municipality office itself is not obliged to perform any activities in this area. Often, this is also linked with personnel limitations, which can be observed particularly in small local government units. Other offices confine themselves to distributing information materials and posting announcements on websites. On the other hand, there are local governments that comprehensively pursue the philosophy of sustainable development. They implement environmental management in municipality offices and also units subordinate to a local government. They address the issues related with environmental solutions to be encompassed in investment processes. They also optimize the application of resources and proactively strive to maintain and improve the condition of nature and landscape assets. Thus, the activities of local authorities in ESD can be described as multi-dimensional. Apart from direct actions related with improving the competencies of employees, educating the local community members, promoting predefined attitudes, there is a number of actions which give the educational effect indirectly. The major purpose of this article is to define the role of local authorities in ESD activities and to provide specific examples of such activities. Thus, an attempt is made to distinguish and systematize the main areas of possible activity.

2. Environmental education and education for sustainable development

In describing ESD related issues it is most important to specify the subject of the description. The notion of ESD in the Polish nomenclature is used definitely less frequently than, for instance, environmental education, particularly in administrative practice. However, the semantic scope of these two terms is different and the results achieved through these two types of education are also distinct (Table 1). The primary distinction refers to the manner and the scope of the description of reality. ESD can be characterized by a holistic approach. The key target area is not environmental protection as such, but a systemic and dynamic approach to phenomena and processes taking place in the world. Thus, ESD covers social,

environmental and economic spheres. It emphasizes mutual relations of these spheres and an existing causal nexus between them. In practice, ESD re-orients educational tasks undertaken in various areas at different levels. Re-orientation is meant to enhance social awareness of sustainable development issues and to provide different social groups with appropriate training [Jutvik & Liepina 2007: 19].

As regards means of expression, ESD does not confine itself to description. It uses tools that stimulate a specific behaviour driving a change in conduct. With the tasks it fulfils ESD moulds attitudes and integrates various spheres of human activity. It also improves such abilities as communication, systemic thinking, critical thinking and cooperation [Hopkins &McKeown 2002: 19].

The major differences between environmental education and education for sustainable development were compared by Jutvik and Liepina, among others

Table 1. Differences between environmental education and education for sustainable development

Environmental education	Education for sustainable development
Talks about the problems of the natural environment.	Talks about integrated problems of environment, efficient use of natural resources, maintaining proper functioning of ecosystems and a good functioning of society and economy.
Deals with environmental problems resulting from human activity and its impact on the environment.	Recognizes that the problems are caused by the conflict between the various objectives of human activities: environmental, social, cultural and economic.
Emphasizes biodiversity.	Emphasizes biological, cultural, social and economic diversity.
Aims at healthy environment.	Aims at good life for the current and future generations.
Promotes actions for the protection of the environment.	Motivates a change in a lifestyle and relies on compelling arguments regarding personal life.
Moulds responsibility for the environment.	Moulds responsibility for the environment and people's lives.
Talks about the behaviour of the individual.	Focuses on increasing competencies for action, including a competence to develop new moral principles and stimulate public participation in a decision-making process.
Is aimed both globally and locally.	Should be based on the local economic, social, cultural and environmental systems and then introduced to the regional, national and global systems.
Includes some school subjects.	Is integrated with all school subjects and with all aspects of school life.

Source: Jutvik & Liepina 2005.

(Table 1). They demonstrated that the communication levels and methods, contents presented, goals set and tools applied were distinct.

It is worth noting that although ESD is by definition an activity that is carried out in educational centres, it may also be widely used by other entities. Moulding proper attitudes, increasing the level of knowledge and enhancing environmental awareness are also included in the activities of cultural and sport centres, extragovernmental organizations and societies, as well as local authorities.

3. The role of local authorities at the local level in education for sustainable development

Due to the fact that the catalogue of ESD functions is extensive and the spectrum of possible activities in ESD is broad, it seems that each action by authorities at the local level can be transposed to ESD. Even those activities that are seemingly unrelated with environmental issues, such as organization of the system of cooperation between local governments, activities of cultural centres, public security or social welfare, can be transposed to ESD. In Poland, additionally, legal regulations impose an obligation on local authorities to carry out activities in environmental education. Pursuant to Art. 403, Clause 2 of the Act: Environmental Protection Law dated 27 April 2001 (consolidated text Journal of Laws of 2013, item 1232, as later amended), municipalities have their own tasks such as financing the environmental protection and water management programs in terms of environmental education and promotion of pro-environmental actions and sustainable development [Korolewska 2013: 258-259]. Moreover, Art. 79 of the aforementioned Act states that administrative bodies are one of the groups of entities that are obliged to incorporate research on environmental protection issues in their activities. There is also a number of detailed regulations which refer, among others, to social participation in the procedures related with arrangements regarding investment activities which might have a considerable impact on the environment or regarding planning works or developing local environmental protection strategies being defined by the Polish legislation as environmental protection programs [Environmental Protection Law, section III]. These activities directly and directly achieve ESD goals through influencing social awareness, promoting specific attitudes and fulfilling strictly educational tasks.

Therefore, it is possible to distinguish three major groups of specific types of tasks fulfilled by local authorities that can be transposed to ESD[1]. The first group

---

[1] Such division is not meant to be classification, and, thus, it is not exhaustive and it is separable. It is rather applied to systematize the phenomenon being described and to group its manifestations such as specific activities performed by local governments.

Table 2. Areas of activity in ESD at the local level

Criterion of Division	Type of Activity	
Nature of impact	Direct	Indirect
Direction of impact	Internal	External
Impact time	Long-term	Short-term

Source: own elaboration.

includes activities categorized by nature of impact, the second group by direction of impact, while the third group by impact time reflected by the management level (Table 2).

The criterion of division for the first group is the nature of an impact instrument being used. A dichotomy is proposed within this group, so that activities can be divided into direct and indirect. Direct activities involve exerting a specific influence on an individual through establishing local laws or issuing administrative decisions. Such influence should be a practical implementation of the rule of sustainable development and it should be obligatory. It may both prescribe a particular behaviour and prohibit taking certain actions. The strength of impact can be severity and inevitability of sanctions related with failure to observe the adopted regulations. Indirect activities, in turn, are based on the use of the same type of instruments, i.e. local laws and administrative decisions. However, they have an optional impact. Indirect activities prefer a specific behaviour of individuals, offering them benefits in exchange. The activities give an opportunity to take any specific action and finally provide a system of incentives and facilitations in performing any such action. Failure to observe the said laws and decisions does not entail any sanction. However, if an individual follows them, he or she may be given benefits and privileges.

Another group was categorized by direction of impact. The impact being oriented at the local community, businesses, organizations and institutions existing within a given area is defined as the external impact. While the impact being oriented at local administration employees, who work in the municipality office and subordinate units, is defined as the internal impact. Activities performed in both of these areas can be obligatory or optional. Apart from the municipalities' own tasks, the external impact can incorporate participation in promotional or informative campaigns or any other activities preferring specific attitudes and behaviours. Activities oriented externally often show an organized form. They can involve the implementation of certain standards and rules or even a comprehensive re-orientation of the individual management system.

The last group includes activities categorized by impact time. It incorporates long- and short-term activities. Long-term activities are rather strategic and they

define the long-term course of action. They are aimed at achieving a certain level of development for a given area or a certain condition of a component. They can also be continuous long-term activities that affect awareness in a given area. Whereas short-term activities are activities of an ongoing nature. The activities are performed in the course of daily administrative practice. They are aimed at solving any specific operating problems. Being taken together, the activities can be treated as a cycle of organized long-term activities.

4. Tools for ESD achievement in administrative practice by local authorities

For the groups being distinguished specific examples of decisions, legal acts or practical activities can be given that can be noted at the local government level: ranging from comprehensive activities incorporating specific tasks such as educational campaigns, through strategic documents such as an analysis of conditions for and directions of area development or an environmental protection program, to organizational decisions (Table 3).

A special group in the proposed division is represented by internal activities that include the organization of the work performed by the municipality office

Table 3. Tools for the implementation of individual actions at local level

Criterion of division	Type of activity	Chosen specific tool
Nature of the instruments	Direct	Rules of maintaining cleanliness and order in the community The decision to accrue fees for the treatment and disposal of the waste
	Indirect	Grant for the replacement of boilers Grant for asbestos roofing exchange
Direction of impact	External	Educational campaigns Ecological competitions
	Internal	Implementation of environmental management systems Optimization of production and waste management in the municipality office
Level of management	Strategic	Environmental protection program The study of conditions and directions of spatial management
	Operational	Decision on the environmental conditions of the investment Decision on building conditions

Source: own elaboration.

and other municipal units. These are activities that can be recognized as good practices. The law does not directly impose any obligation to perform such activities, nor are any additional funds assigned for them from the central budget. The type and scope of the activities are each time determined on the initiative of local authorities and persons responsible for the management of the office (secretaries and directors of individual departments). The group being discussed covers implementations of environmental management systems and integrated management systems or activities aimed at minimizing the use of resources, selective collecting the waste or recycling [Giordano 2005]. These are widespread practices in the Polish local governments. What is interesting is the fact that they apply not only to the biggest cities such as Warsaw, Poznań, Kraków or Wrocław[2]. Similar activities being planned on a wide scale are also performed, among others, in Dzierżoniów in the Province of Dolnośląskie, in Racibórz or Bielsko-Biała [Batko 2009: 93].

An indirect impact is significant alike. The impact results from the activities that are targeted towards the general community of the municipality. Any forms of subsidies granted by or through administrative bodies are most popular. They practically enforce the provisions of strategic documents adopted at the national level, e.g. Asbestos Removal Program in Poland for Years 2009-2032 or National Program for Municipal Sewage Treatment, and also the documents at the level of a province, county or municipality (e.g. low emission reduction programs, municipal rules of maintaining cleanness and order).[3] They form an effective system of economic incentives that prefers specific behaviours. Under the said documents subsidies are granted, for instance, for changing asbestos roofing or heating sources, and preference rates are applied for those individuals that collect waste selectively or exemption from parking fees is granted for the owners of electrically driven cars. As a result, the educational effect is indirect, but linked with a permanent change in attitude, e.g. with modernization of heating sources, commencement of selective waste collection, proper handling any liquid waste.

---

[2] For instance, in Poznań four departments of the City Hall (Municipal Management Department, Real Estate Management, Environmental Protection Department and Procurement and Office Service Department) and also Zakład Zagospodarowania Odpadów sp. z o.o. [Waste Management Company Pty] and Municipal Roads Administration hold an environmental protection management certificate compliant with ISO 14001:2004 and a quality management system certificate compliant with ISO 9001:2008. The first certification in this area was done in the Poznań City Hall in 2002. The quality management system certificate compliant with ISO 9001:2008 was issued for the entire Poznań City Hall and 12 other municipal units, e.g. The Raczyński Library, The Poznań Centres of Sports and Recreation or City Guard of Poznań, cf. http://bip.poznan.pl/bip/system-zarzadzania,doc,737/certyfikaty-systemu-zarzadzania,47809.html [9.12.2015].

[3] Asbestos Removal Program in Poland for Years 2009-2032 adopted by virtue of Resolution by the Council of Ministers on 14 July 2009, amended by Resolution dated 15 March 2010, and National Program for Municipal Sewage Treatment – Update 2015 (project).

The effectiveness of these activities is measurable as opposed to typical educational activities.

As regards those influences for which the time factor is crucial, long- and short-term influences can be distinguished. As discussed earlier, they are closely related with the management level. Long-term activities are strategic. These include plans, programs, policies and strategies that, directly or indirectly, refer to the issues of sustainable development. The municipal environmental protection program and the analysis of conditions for and directions of land development are most important in this area. Both of these documents are required by legal regulations, but they do not have the effect of a local legislation act. The documents are strictly related with any type of plans and sector programs such as low emission reduction program, sustainable development plan for transport, plan of environmental protection against noise, environmental education program or others. They describe the strategy of local governments in a given area and form a basis for taking operational decisions. Often, their component is an element concerning education in a given area[4]. As regards a short-term effect and operational nature, any activities within administrative practice can be seen as such. These activities primarily include issuing administrative decisions. The decisions define e.g. the conditions and methods of completing the investments, including any possible impact on the natural environment. An important component of the said activities is the evaluation of impact on the environment, according to the provisions of the Act on Availability of Information on Environment and Its Protection, Participation of Society in Environmental Protection and Evaluation of Impact on Environment[5]. One significant educational advantage is that the society can participate in ongoing administrative proceedings and that residents must be informed about the condition of the environment to the extent and on the terms defined by the aforementioned Act.

5. Conclusion

Activities for ESD can be performed not only through educational centres, but also local governments. The latter should exert a broad influence on the social at-

---

[4] Program of Environmental Protection Against Noise for the Poznań City provided as Attachment to Resolution No. LX/927/VI/2013 by the Poznań City Council dated 10 December 2013, Chapter 5.4.3, or Program of Environmental Protection for the Poznań City for Years 2013-2016 with Prospects Until 2020, provided as Attachment No. LX/928/VI/2013 by the Poznań City Council dated 10 December 2013, Chapter 3.13.6.

[5] Act on Availability of Information on Environment and Its Protection, Participation of Society in Environmental Protection and Evaluation of Impact on Environment dated 3 October 2008 (consolidated text Journal of Laws of 2013, item 1235, as later amended).

titudes and awareness in the area of rules of sustainable development. Apart from fulfilling their own tasks in environmental education, local authorities formulate strategies, adopt local legal regulations and issue administrative decisions. In the majority of cases the educational effect is then a by-product which is permanent and connected with a change in attitudes and behaviours.

Local administration can also affect in a special way their own employees in the municipality office, city hall and subordinate units: public enterprises, municipal companies, educational centres. Implementing environmental management systems, optimizing the application of resources at the posts or fulfilling any specific projects can in real terms ensure appropriate training for such employees. The issues that would need further analysis include the effectiveness of the activities in relation to the condition of the environment within a given area and also funding such activities in the context of the results they bring.

References

Batko R., 2009, *Zarządzanie jakością w urzędach gminy*, Kraków: Wyd. Uniwersytetu Jagiellońskiego.

Giordano K., 2005, *Planowanie zrównoważonego rozwoju gminy w praktyce,* Lublin: Wyd. KUL.

Hopkins C., McKeown R., 2002, *Education for sustainable development: An international perspective*, in: *Education and Sustainability: Responding to the Global Challenge*, eds. D. Tillbury, R.B. Stevenson, J. Fien, S. Schreuder, Gland, Switzerland – Cambridge: UCN Commission on Education and Communication (CEC), IUCN – The World Conservation Union.

Jutvik G., Liepina I. (eds.), 2007, *Education for change. A handbook for teaching and learning sustainable development,* www.balticuniv.uu.se/index.php/component/content/article/124-educationfor-change-teaching-materials/336-the-educ-teaching-materials [7.12.2015].

Korolewska M., 2013, Informacja na temat jakie zadania własne gminy mają charakter obowiązkowy, *Zeszyty Prawnicze Biura Analiz Sejmowych Kancelarii Sejmu*, 4(40): 244-267.

National Program for Municipal Sewage Treatment, 2015 (project).

Program of Environmental Protection Against Noise for the Poznań City provided as Attachment to Resolution No. LX/927/VI/2013 by the Poznań City Council, 10.12. 2013.

Program of Environmental Protection for the Poznań City for Years 2013-2016 with Prospects Until 2020, provided as Attachment No. LX/928/VI/2013 by the Poznań City Council, 10.12.2013.

Asbestos Removal Program in Poland for Years 2009-2032 adopted by virtue of Resolution by the Council of Ministers on 14 July 2009, amended by Resolution of 15.03.2010.

Act: Environmental Protection Law dated 27 April 2001, consolidated text *Journal of Laws* of 2013, item 1232, as later amended.

Act on Availability of Information on Environment and Its Protection, Participation of Society in Environmental Protection and Evaluation of Impact on Environment dated 3 October 2008, consolidated text Journal of Laws of 2013, item 1235, as later amended.

Rola władz lokalnych w edukacji na rzecz zrównoważonego rozwoju w Polsce

Streszczenie. Działania edukacyjne są podstawą zrównoważonego rozwoju. Szczególną rolę w tym procesie odgrywają jednostki samorządu terytorialnego, a przede wszystkim gminy. Wykonując swoje zadania, bezpośrednio i pośrednio spełniają wymogi edukacji na rzecz zrównoważonego rozwoju. Bezpośredni wpływ przejawia się w działaniach edukacyjnych, promocji i innych aktywnościach wpływających na oddziaływanie mieszkańców na środowisko. Działania pośrednie wynikają z realizacji zadań w zakresie ochrony środowiska, planowania przestrzennego lub inwestycji. Korzystając z tych kanałów, władze na poziomie lokalnym mogą wpływać na mieszkańców i inne zainteresowane strony, aby zachęcić ich do pożądanych zachowań, kształtować właściwe postawy i promować konkretne wzorce. Głównym celem artykułu jest zwrócenie uwagi na rolę administracji publicznej na poziomie lokalnym w zakresie edukacji na rzecz zrównoważonego rozwoju i wskazanie przykładów działań, jakie mogą być podejmowane w tym obszarze.

Słowa kluczowe: edukacja dla zrównoważonego rozwoju, władze lokalne, efektywność, zarządzanie

Natallia Danilava*

Sustainability Management of Industrial Enterprises and an Assessment of its Effectiveness

Abstract. The article deals with the concept of sustainable development (SD) management and conditions to achieve SD of an industrial enterprise. The structure of sustainability management is presented. It is proved that organizational structure of management is the basis for assessing the effectiveness of the SD of an enterprise. It is shown that to assess the effectiveness of the management of SD of the enterprise, there should be indicators used characterizing the level of manageability and the growth level of the organizational management structure. It is shown that with the help of an indicator like the manageability level, it is possible to determine the stability boundaries of an enterprise.

Keywords: sustainable development (SD) of industrial enterprise, the system of sustainable development management, organizational structure of management, technology of transparent governance, monitoring of the business environment of an enterprise, the stability boundary

1. Introduction

One of the 17 sustainable development goals after 2015 is to ensure the sustainable consumption and production patterns. High level of consumption is achieved at a great cost - intensive exploitation of natural resources and ecological imbalance, irrational use of production and human potentials.

Today, for civilized consumers it is already not enough to have guarantees of the "right" course of business. The consumer wants that activities of the company would not cause damage to the environment, the working conditions at the plant would not cause harm to the health of its employees, the social atmosphere in the

* Minsk branch of Moscow State University of economics, statistics and informatics, Minsk, Belarus, e-mail: nsdanilova@mail.ru, phone: 375 29 678 78 38.

company would be favorable, financial activities of the company would be transparent for employees, investors and society [Young, Hwang, McDonald & Oates 2010].

Currently, much attention is paid to the SD of industrial enterprises. Various indicators and indices which can determine the growth and development of the company are highlighted. However, we often consider only the factors of development in the form of changes in the external and internal conditions of life: macro-economic processes in market conditions, the condition of the property and intellectual potential of the organization. In addition, one of the main problems of SD of industrial enterprise is the problem of creating a unified management system that will ensure the SD, and the lack of the technology to define the sustainability boundaries of companies.

2. The concept of SD management system of industrial enterprise

By the type of metabolism and energy exchange with the environment, the company is an open dynamic system characterized by stability as an important feature. An industrial enterprise belongs to complex systems which are characterized by such properties as: non-additivity, purposefulness, emergence, desire for the establishment and maintenance of homeostasis [Krishans, Mutule, Merkuryev & Oleinikova 2011].

One can imagine the system of industrial enterprises as the interaction of economic, environmental and technological subsystems. Currently, the development of the enterprise management system is subjected to economic priorities which can lead the management system to an unstable state. Thus, it becomes apparent that to ensure SD of enterprise management system it is needed to change the priorities of economic development for the environmental ones as only the sustainability of ecological subsystem makes it possible to ensure the stability of the other two subsystems [Farber, Costanza & Wilson 2002; Hasna 2007; Mamingi 2011].

The system of SD management of the enterprise is a unified enterprise management system based on a targeted, collaborative, coordinated management of all types of its operations, knowledge of managers and employees and ensures the achievement of the main goal – the sustainable development of the quality of stakeholders' life on the basis of competitive enterprise activities [Danilava 2015].

Thus the sustainable state of enterprise management system, in terms of natural laws, is "the ability of a dynamical system to keep traffic on the planned trajec-

tory of development (to maintain the intended mode of operation), despite the indignation impact on it."

International Standard ISO 9004-2009 "Managing for the sustained success of an organization – A quality management approach" focuses the enterprise on setting quality objectives and achieving them by improving the activities of all the structures of the enterprise in cooperation with the stakeholders on the basis of the quality management system, replacing the internal and external audits by self-control (ISO 9004:2009). In turn, one of the key needs and expectations of stakeholders is the transparency of governance. Transparency is required at all levels of the organizational structure and in all functions and technologies of transparent management. It is also necessary to speak about the environmental, financial, technological, and social responsibility of the enterprise.

3. Technology of implementation and assessment of SD management system of the enterprise

To implement the system of SD management and to assess its effectiveness, we can use: technologies for SD of the enterprise and technology of transparent management. These technologies use 3 modern management theories:

– The theory of manageability measurement [Vysotskiy 2004],

– Theory and Methodology of transients [Vysotskiy 2013],

– Transparent management in the system of SD management [Vysotskiy, Garchuk & Danilava 2015].

Table 1 indicates the basic functions of the SD management of the enterprise.

Table 1. The major functions of the SD management of the enterprise

Function description				
Enterprise policy creation, planning and implementation	System procedures for enterprise sustainability management (including elements and their specifics)	Resource management (including human resource management)	Monitoring, measurment, analysis and forecasting of correctives for enhancing the enterprise sustainability management system	Enhacing, implementation of innovations, mentoring in enterprise sustainability management system

Source: own elaboration.

The structure of the system of SD management of enterprises consists of four levels – strategic forecasting, strategic planning, short-term (tactical) and operational level.

Strategic forecasting level (10-15 years) reflects:

– the concept of SD of the enterprise on the basis of scientific and technical progress.

Strategic planning level (5 years) reflects:

– the company's mission and strategy, including conditions for the development of organizational structure and its elements,

– the purpose of the management of SD of the enterprise and the challenges based on the sub-levels and elements of the organizational structure.

Short-term (tactical) level depends on the sublevels and organizational structure and includes:

– the processes and procedures of SD management of the enterprise, adjusted for the peculiarities of the current organizational structure and the conditions of its adjustment,

– the monitoring system including indicators and criteria of processes of SD management, procedures for the collection and analysis of data on the processes and results of sustainability management, methods of assessing the effectiveness of management processes of sustainable development and the mechanism for the development, adoption and implementation of management decisions for each of the processes and elements of organizational structure,

– the operational level deals with industrial process control where the main target of management is personnel.

To achieve sustained success the company's senior management should take an approach in terms of the perspective of quality management. Processes of SD management should be implemented through a special functions of management, which are regulated by the "quality loop" of international standards of ISO 9000. The special functions of management include: policy control; marketing management; sales control; procurement management; financial management; quality management system; human resource management and "knowledge;" production management.

The process of special functions management is implemented through the general functions of management and assessment of their manageability level, and allows to determine the effectiveness of the special function in the sustainable development management of enterprise. The general management functions include: management decisions; organization of control and monitoring of the implementation of decisions; controlled accounting decisions; planning of actions to implement the decisions; analysis and evaluation of performance management and indicators of control; adjustment of administrative decisions to

achieve the level of control in the plans; encouraging achievements of administrative decisions.

All of these functions consider the peculiarities of implementing them into strategic, tactic and operational modes adjusted for the organizational structure of management.

4. The role of organizational structure in the assessment procedure of SD management system of industrial enterprise

Diagnostics of SD management efficiency of enterprises covers eighteen functions of management and involves measuring the manageability level at a certain stage of development of the enterprise. The manageability level is the integrated indicator of the effectiveness of the management process. It describes and evaluates the state of the system as a whole, integrating administrative, economic, organizational and social aspects at a specified time [Vysotskiy 2004: 70].

This diagnosis is based on the organizational structure of management of the enterprise; staffing and functional responsibilities of employees.

Diagnostics of the effectiveness of the SD management on the basis of organizational structure of management allows to evaluate:

– links between departments and specialists in the implementation of the basic functions of SD management of the enterprise,

– completeness of management functions for implementing basic functions of SD management of the enterprise,

– feasibility and fullness of information flows in implementing basic functions of SD management,

– problem areas in managing the implementation of the main functions of SD management of the enterprise.

For the distribution of the goals, objectives, procedures at every level of SD management the manager should use the organizational management structure and assign responsibility for managing the implementation of the strategy for SD at every level of management. Job descriptions help to determine the completeness of the regulated responsibilities at all levels of SD. Duties missed in the job descriptions are included in "problem areas," since it is not clear who implements them and the failure rate of management actions is determined for the successful development of manageability levels of the enterprise.

Problem areas in the SD management of enterprises have their own:

– executors,

- boundaries in the manageability levels,
- negative effects as a "braking force" that prevent the successful development of the enterprise,
- costs to neutralize the problems in management,
- losses of the market and time during which problem areas exist.

Analysis of problem areas at manageability levels and management processes of SD stipulates the starting point for management process development and corresponding indicators of effectiveness. Application of the theory of measuring the manageability level, makes it possible to model the chart of the company's development or determine deviations from it (Chart 1).

Chart 1. The company's development
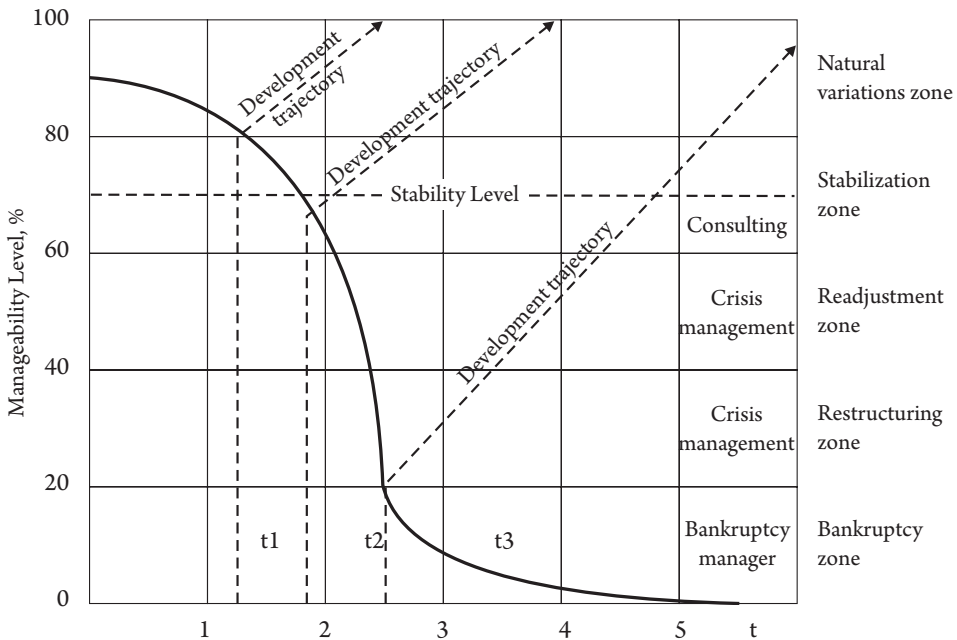
Source: Vysotskiy 2004: 60.

Figure 1 shows the stability boundary conditions of the enterprise, the boundaries of the transition from one area to another and the actions contemplated by the definition of the level of danger.

Each zone has its tolerances and management system must respond adequately to the discrepancy amplitude:
- zone of normal operation (discrepancy amplitude in the range of ±2,5%),
- zone of natural discrepancy (discrepancy in the amplitude range of ±5%),

Manageability Level, %	
97.5	Transfer zone to new managerial conditions
95.0	Zone of attention
92.5	Zone of natural variations
90.0	Normal conditions zone
87.5	Normal conditions zone
85.0	Zone of natural variations
82.5	Zone of attention
80.0	Transfer zone to new managerial conditions
77.5	Sustainability loss zone

Figure 1. Zones of enterprise manageability

Source: Vysotskiy et al. 2015: 302.

– zone of increased attention which requires more intensive monitoring, transition monitoring control points (the discrepancy amplitude in the range of ± 7,5%),

– zone of transition to the new conditions of management consulting part in determining the causes and stabilization programs of SD of the enterprise (the discrepancy amplitude in the range of ±10%),

– zone of stability loss (the discrepancy amplitude in the range ≥10%).

The business environment of enterprise may be volatile and uncertain, therefore, to control the development of the sustainable success of the organization, the manager needs to determine (through procedures of transparent management): a long-term forward planning; monitoring the business environment of the organization; regular assessment of compliance with current plans and procedures; emerging markets and technology; potential risks; ongoing improvement and innovation.

The monitoring procedure (as an element of transparent management technology) allows to monitor the development of tolerance for developing and braking forces among personnel, determine the speed of developments and to inform the leaders of the sustainable management on the need to make decisions adequate to the situation.

5. Conclusion

This paper describes the situation occurring at the competitive market. It is proven that the task of implementation, development or adoption and certifying the unified management systems for enterprises is very typical for sustain-

ability managers. Applying contemporary approaches to enterprise management allows to evaluate effectiveness of these systems using specific indicators. Those indicators help to determine the reserves of time to neutralize the problems in the management of special functions and discover the compliance of them with operational, current and strategic development plans and programs given vectors of development.

References

Danilava N., 2015, Management organizational structure as the main element in the assessment of the effectiveness of the management system for sustainable development of the enterprise, *Vestnik BGU*, seriya 3(3): 86-90.

Farber S.C., Costanza R., Wilson M.A., 2002, The Dynamics and value of ecosystem services: Integrating economic and ecological perspectives, *Ecological Economics*, no. 41: 457-478, www.elsevier.com/locate/ecolecon [15.10.2015].

Hasna A.M., 2007, Dimensions of sustainability, *Journal of Engineering for Sustainable Development: Energy, Environment, and Health*, vol. 2(1): 47-57.

ISO 9004:2009 Managing for the sustained success of an organization. A quality management approach, www.iso.org/iso/catalogue_detail?csnumber=41014 [15.10.2015].

Krishans Z., Mutule A., Merkuryev Y., Oleinikova I., 2011, *Dynamic Management of Sustainable Development. Methods for Large Technical Systems*, London: Springer.

Mamingi N., 2011, Enterprise and Sustainable Development: Role, Challenges and Opportunities, *Journal of Economics and Sustainable Development*, vol. 2, no. 11-12, www.researchgate.net/profile/Nlandu_Mamingi/publication/228452480_Enterprise_and_Sustainable_Development_Role_Challenges_and_Opportunities/links/0c96051a530ee913c4000000.pdf [15.10.2015].

Vysotskiy O.A., 2004, *Teoriya izmereniya upravlyaemosti hozyaistvennoy deyatelnostyu predpriyatiya*, Minsk: Pravo i ekonomika.

Vysotskiy O.A., 2013, *Teoriya i metodologiya perehodnyh processov na primere mnogootraslevyh proizvodstvennyh predpriyatiy*, Minsk: Pravo i ekonomika.

Vysotskiy O.A., Garchuk I.M., Danilava N.S., 2015, *Osnovy ustoichivogo razvitiya proizvodstvennoy organizacii*, Minsk: Pravo i ekonomika.

Young W., Hwang K., McDonald S., Oates C.J., 2010, Sustainable Consumption: Green Consumer Behaviour when Purchasing Products, *Sustainable Development*, vol. 18, no. 1: 20-31.

Zrównoważone zarządzanie przedsiębiorstwem przemysłowym i pomiar jego efektywności

Streszczenie. Artykuł poświęcony jest koncepcji zarządzania zrównoważonym rozwojem oraz czynnikom, które warunkują zrównoważony rozwój przedsiębiorstwa przemysłowego. Omówiono w nim strukturę zrównoważonego zarządzania, a następnie wykazano, że struktura organizacyjna jest podstawą oceny efektywności zarządzania zrównoważonym rozwojem przedsiębiorstwa. Ukazano również, że do oceny efektywności zarządzania zrównoważonym rozwojem przedsiębiorstwa powinno używać się wskaźników charakteryzujących poziom zarządzalności oraz poziom wzrostu struktury organizacyjnej. Dowodzi się ponadto, że za pomocą takiego wskaźnika jak poziom zarządzalności można określić granice stabilności przedsiębiorstwa.

Słowa kluczowe: zrównoważone zarządzanie przedsiębiorstwem przemysłowym, system zarządzania zrównoważonym rozwojem, struktura organizacyjna, technologia transparentnego zarządzania, monitorowanie otoczenia ekonomicznego przedsiębiorstwa, granice stabilności

Studies
and Research Works

Olena Maksymets*

Ukrainian forest sector competitiveness through the incorporation of sustainable development aspects into an MBA in Forest-related Industry Program

Abstract. Sustainable development (SD) awareness continues to rise within the general public and is being extensively incorporated within academia, institutions, and business. As it is impossible to reach the needed level of awareness without adequate education, cooperative education partnerships should be established. The paper reveals the survey results and outcomes concerning the need for developing and implementing an industrial (Forest-related Industry) Master in Business Administration (MBA) program at the Ukrainian National Forestry University. The content of such a proposed program was also discussed. It was found that by developing and communicating the understanding about the connections between sustainability and business, companies can enhance their value, measure and manage change, and drive improvement and innovation. Considering the increasing demand for MBA programs it is crucial to implement sustainable development aspects into each proposed course. A hypothesis was made that sustainable development aspects are important both for the MBA program and for the industry. The paper concludes with a proposal of possible partnership and benefits for both academia and the forest-related industry in Ukraine.

Keywords: cooperative education partnerships, MBA in Forest-related industries, sustainable development in MBA program, business and sustainable development, Ukraine

1. Introduction

Cooperative education partnerships between industrial companies and universities are becoming increasingly common in response to fundamental challenges facing both sectors [Hing & Breen 2002]. S. Hase indicates that "cooperative education partnership is a partnership between an educational institution and an

* Ukrainian National Forestry University, Lviv, Ukraine, Department of International Business Management, e-mail: alyona.maksymets@gmail.com, phone: 38 095 536 43 37.

industry in which education and training is jointly developed and delivered for the principal benefit of employee and employer" [Hase 1997]. According to John Codd the primary goal of education policy is to enable learners to acquire the skills and abilities required for them to perform more effectively, more productively, within a changing global labor market [Codd 2005] and hence to perform more competitively. David R. Powers, Mary F. Powers, Frederick Betz and Carol B. Aslanian [1988] discussed partnerships between businesses and higher education from the standpoint of effects on higher education traditions, policies and practices; business productivity and competitiveness; and opportunities for leadership.

An ever-greater number of companies become more concerned about their competitive position, recognize the need to adopt new technologies and strategies, improve training of their employees, maintain the image and make their operations more sustainable. At the same time, governments, stock exchanges, markets, investors, and society at large are calling on companies to be transparent about their sustainability goals, performance and impacts [GRI 2013a]. Sustainable development awareness continues to rise within the general public and is being extensively incorporated within academia, institutions and business. By developing and communicating their understanding about the connections between sustainability and business, companies can enhance their value, measure and manage change, and drive improvement and innovation [GRI 2013b]. And with all these changes higher education should play important role in the new corporate development.

For the university, the key benefits include improved educational offerings; enhanced university reputation in the discipline and cooperative education partnerships; additional student fees and economies of scale; funds for discipline development and research and consultancy opportunities.

Education for Sustainable Development (ESD) is a concept that became popular after the 1992 Rio Earth Summit. Agenda 21, an outcome of this summit, identified education as a key component in achieving any sustainable development goals [UN 1992]. Significant progress has been made in meeting many development challenges and in 2030 Agenda it is emphasized on the need for all learners to acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles [UN 2015].

2. Methods and materials

In this paper we used qualitative case study methodology in order to get the description of the attitude of different groups of respondents towards new indus-

trial MBA program [Baxter & Jack 2008; Hyett, Kenny & Dickson-Swift 2014; Merriam 2009; Stake 1995; Yin 2003].

The methodology should be considered when: the focus of the study is to answer "how" and "why" questions; you cannot manipulate the behavior of those involved in the study; or the boundaries are not clear between the phenomenon and context [Yin 2003].

The case was the cooperative education program – MBA in Forest-related Industry at Ukrainian National Forestry University. The data were collected through personal interviews and online survey. Responses were gained from 65 respondents: owner of the company (3.6%), top management/CEO (7.1%), middle manager (35.7%); senior specialist/team leader (7.1%), specialist (21.4%); students (25%). So the majority of the respondents were business representatives (49).

The questionnaire was developed for a more extensive study, so the questions relevant to this paper focused on attitude of respondents to the industrial MBA program as well as there understanding of its content.

Next stage of the study was conducted through the discussions and interviews of business representatives during the Seminar-presentation "MBA in Forest-related Industry". The seminar was held on the 9th of June 2015 at Ukrainian National Forestry University. It was developed and conducted in cooperation with the Swedish University of Agricultural Sciences (Swedish University of Agricultural Science, Uppsala, Sweden) and with the support of the Swedish Foundation for international cooperation in research and higher education (STINT).

Questionnaires and interview transcriptions were analyzed using content and thematic analysis.

3. Results

3.1. Substantiation of the project

Cooperative education partnerships between industries and universities are becoming increasingly common in response to fundamental challenges facing both sectors [Breen & Hing 2001] and especially in modern conditions. According to Simon Marginson [1993; 1997] education can take the form either of a public good that is non-marketable or of an individualized positional good that is subject to competition, exclusion and sale for profit.

Glenn R. Thiel and Nell T. Hartley [1997] stated that the idea of colleges and business coming together through cooperative education programs not new and not geographically limited. Also they proved that it is necessary to constructively question the current value of such programs and to expand the dialogue concerning the strategies to reengineer them [Thiel & Hartley 1997].

Strong relationships between educational institutions and industry are fundamental to the cooperative education [Flemin 2012]. But there are significant challenges to cooperative education partnerships through a lack of funding, understanding of the meaning and purpose among different stakeholders and motivations for participantsof such educational programs [Beggs, Ross & Knapp 2006; Flemin & Hickey 2013; Martin & Leberman 2005; Patrick, Peach, Pocknee, Webb, Fletcher & Pretto 2008; Weis & Smith 2005].

As it is important for companies to conduct their activities responsibly and in a sustainable way, universities should develop programs giving opportunities for current and future managers not only to get new skill and knowledge, but also adequately address sustainability aspects in their managerial practice. Considering increasing demand for MBA programs, from our point of view, it is important to incorporate SD aspects into each course proposed within the program.

The hypothesis of the research – sustainable development aspects are very important both for the MBA program and for the industry's competitiveness.

Fundamental challenges facing forest-related industries in Ukraine and the higher education are leading to the development of cooperative education partnerships. Thus it is important to study the demand for partnership programs and study the benefits expected by participating industry and university. In this paper we describe the case study of the possible international university-business partnership.

We describe one of such potential partnerships and review possible benefits, which in theory should occur to the partners. This partnership should be the MBA in Forest-related Industries – the venture between Department of International Business Management, Division of Forest Products and Markets and the management of forest-related industries in Ukraine.

The project started in 2013 when the Department of International Business Management (Ukrainian National Forestry University, Lviv) together with the Department of Forest Product (SLU, Swedish University of Agricultural Studies, Uppsala) decided to apply for the initial collaboration grant to STINT (The Swedish Foundation for International Cooperation in Research and Higher Education).

The working hypothesis was that the MBA in Forest-related Industries program should be designed for Ukrainian businessmen and incorporate both theoretical and practical background of how to make forest-related industries in Ukraine more productive and profitable (managerial and economic pillars) and at the same time oriented on sustainable development and bioeconomy aspects (environmental and social pillars).

Within the market approach, education is viewed as a product and schools are seen as being similar to small business firms [Codd 2005]. And this is the area where the knowledge and expertise from European countries was needed.

The aim of the joint project was to start the collaboration and study the demand for the new Program – Master in Business Administration in Forest-related Industries. And it was determined that the integral part of this program should be sustainable development.

Activities to achieve the target for joint project were:

– exchanging experience in teaching regarding forest sector with special attention to SD aspects,

– development of new courses and educational materials for MBA in Forest-related Industry program,

– guest lectures of Ukrainian teachers at SLU and Swedish teachers at UNFU (also lectures by business representatives and consultants in the forest industry),

– short-term exchange visits of students from Sweden and Ukraine (with possible defense of Master Thesis in partner-countries).

Such cross-country cooperation is considered to become not only helpful for Ukrainian industry to be more competitive and recover from crisis, but also favorable for the development in Baltic Sea region, as forest products are traded a lot within the region. Biomass as energy source is one of the top issues in the region [Maksymets & Lonnstedt 2015]. Clear cutting in Ukraine (as the consequence of poor managerial skills) and unemployment in the sector directly affects the entire Baltic Sea region (rivers, mountains, air, illegal trade etc).

3.2. Survey of MBA importance to the forest-related industry

The results of the survey showed that more than half of the respondents knew about MBA programs in general and 44.1% had an idea about such opportunities. Also the majority (52.9%) expressed a willingness to study within any MBA program (Table 1).

Table 1. Results of the awareness about MBA programs in general

Answer	Results (% of respondents)
Yes, I know about it	52.9
I have a general idea	44.1
No, I don't know anything about this	3.0

Source: own elaboration.

The industrial orientation of the Program was considered as a benefit: 43.8% of the respondents agreed that it will give an opportunity to get a deeper un-

Table 2. Answers of the respondents to the question "Is industrial orientation
of the Program important to you?"

Answer	Results (% of respondents)
Yes, it will give opportunity to get deeper understanding of business process	43.8
Yes, it will give better insight of industrial peculiarities	50.0
No, it significantly narrows the possibilities	3.1
No, it reduces the image	3.1

Source: own elaboration.

derstanding of business processes and 50% agreed that it will give them a better
insight of industrial peculiarities (Table 2).

The major factors influencing the decision to study within MBA program
were: progress in career (41.2%) and establishing their own company (32.4%)
(Table 3). Also getting better results on the current position were important for
respondents (23.5%).

Table 3. Answers of the respondents to the question "Why it is important to study
for an MBA degree from your point of view?"

Answer	Results (% of respondents)
For establishing your own company	32.4
For the progress in career	41.2
For better results on the current position	23.5
Other	3.1

Source: own elaboration.

The most important outcome from MBA program was seen as improvement
of leadership skills and development of managerial competencies and getting
knowledge and experience necessary for successful work (39.4%) (Table 4).

Table 4. Answers of the respondents to the question "What can be the most important
outcome from studying on MBA?"

Answer	Results (% of respondents)
Skills and experience necessary for successful work	39.4
Improvement of leadership skills and development of managerial competencies	48.5
Expanding horizons, learning about people's experience	12.1
Other	3.1

Source: own elaboration.

Table 5. Answers of the respondents to the question "With which of the following statements do You agree?"

Answer	Results (% of respondents)
Any MBA is prestigious and will help in a career	60.6
I'm interested in the diploma only of a certain school because it has positive reviews	15.2
MBA itself is not that important as the developing critical thinking and establishing new connections during the study	15.2
Disagree with any of the above statements	9.1

Source: own elaboration.

Any MBA program was considered as prestigious and helpful in a career by more than 60% of respondents (Table 5).

Also it was revealed that the most demanded courses are: Management of Production Processes and Quality, Industrial Marketing, Finance and Investing, Global Outlook of Forest Sector, Organizational Behavior, Value-Added Chains (incl. Logistics), Strategic Management, as well as Business Planning.

The most important factors for the respondents were the assistance of well-known coaches and specialists in educational process (9.26), highly-qualified teachers (9.23) and possibility to have internships abroad (9.14) (Table 6).

ESD will benefit the University and Department in developing MBA in Forest-relate Industries Program as the content of the program incorporating sustainability aspect was also important for the respondents. It should be stated that Ukrainian National Forestry University is the only higher education institution with forestry profile in Ukraine.

Table 6. Rating of some criteria importance

Criteria	Importance*
Distant learning	6.74
Mode of study	7.26
The cost of training	7.66
The specialization of study (industrial)	8.00
The content of the program (incorporating sustainability aspect)	9.09
The assistance of well-known coaches and specialists in educational process	9.14
Highly-qualified teachers	9.23
Internships abroad	9.26

* 1 not at all important, 10 is very important. The average value is presented in table.

Source: own elaboration.

During its history, the University has become a prominent center of forestry engineering and environmental economics education in Ukraine.

4. Structure of the MBA Program in Forest-related Industries

The structure of the MBA program in Forest-related Industries was further presented to the business representatives during the seminar held on the 9th of June 2015 at Ukrainian National Forestry University. On the basis of the discussions and interviews the content of the program was structured, refined and updated (Fig. 1).

The program should start with the course "Management of Production Processes and Quality" (ECTS credits – 7, workload – 210, contact hours – 90, self-study – 45, exam preparation – 75). Students should have basic knowledge in Economics and Management and experience in any field of operations. The module is designed to understand the importance of production processes and business operations. Students learn the tools and methods for managing production processes. As well they get the basic understand on how to apply them.

The module should be designed to understand the importance of production processes and business operations. Within this course students should learn the tools and methods necessary for managing production processes.

Semester I

Management of Production Processes and Quality	Industrial Marketing	Finance and Investing	Global Outlook of Forest Sector
7 ECTS	7 ECTS	8 ECTS	7 ECTS
210 90/45/75	210 110/55/45	240 150/50/40	210 110/60/40

Semester II

Organizational Behavior	Value-added Chains (incl. Logistics)	Strategic Management	Business Planning
8 ECTS	7 ECTS	8 ECTS	8 ECTS
240 120/65/55	210 120/60/30	240 120/70/50	240 120/70/50

Semester III

Corporate Project	Master Thesis
10 ECTS	20 ECTS
300 -/300/-	600 60/540/-

Figure 1. Structure of the MBA program in Forest-related Industries

Source: own elaboration.

As well they get basic understanding of how to apply them. Main topics that are covered within the course:

– responsibilities and possibilities of production (operations) manager within the forest-related enterprise considering sustainable development aspects,

– production management on different types of forest-related enterprise,

– peculiarities of operating systems of forest-related enterprise with the emphasis on sustainable development,

– importance of Quality Management (ISO 9000, ISO 14000 etc) on forest-related enterprises,

– state-of-art tools applicable in production and quality management on forest-related companies,

– case studies concerning the way companies meet operational challenges and be competitive.

Module content: Industrial solutions (analysis of competitive advantage of the enterprise in forest-related industry); Production and Operations Management (fundamentals of all operations functions within business); Quality management (impact of quality management on business performance in forest-related industry); Production systems – application of principles to different areas and fields in operations management in forest-related industry.

Next course is "Industrial Marketing" (ECTS credits – 7, workload – 210, contact hours – 110, self-study – 55, exam preparation – 45). Students should be familiar with main trends on the global forest products market, understand the peculiarities of the production and distribution process within forest-related industries and also they should be able to prepare presentations in PowerPoint. The module is designed to give students information about the principles of industrial and applied marketing, as well as international commercial transactions.

Main topics that are covered within the course:

– understanding of basic market forces influencing the development and shifts on forest products markets with special attention to sustainable development,

– understand the influence of unemployment, inflation economic growth/crisis on market development and shifts,

– the role of stakeholders on the development of marking strategy for forest-related companies including environment protection organizations, wild-life saving funds, sustainable forest management organizations etc.,

– development and implementation of market strategies as the integral part of business strategies of the forest-related enterprises with consideration of sustainable development aspects.

Module content: Applied Marketing (understanding of basic market forces of supply and demand in different competitive conditions, application of marking tools and methods in forest-related industry); Industrial Marketing (understand the market forces influencing forest-related industries, develop and implement

marketing strategies); International Commercial Transactions (understand the basic commercial relations and transactions within the forest-related industry).

Before starting the course "Finance and Investing" (ECTS credits – 8, workload – 240, contact hours – 150, self-study – 50, exam preparation – 40) students should know the basics of Economics, Financing and should be able to work with MS-Excel. This module is designed to impart knowledge, skills and experience to understand the fundamental principles of finance and investing. It focuses on aspects which are relevant for decision-making. The module is divided into two parts, delivered correspondingly in the 1st and 2nd semester of the study.

Main topics that are covered within the course:

– detailed evaluation of and controlling of costs and analysis of financial performance, corporate social responsibility (CSR), sustainability reporting and global reporting initiative (GRI),

– financial budgeting, choosing financial sources and working capital management,

– financial forecasts based on accounting data,

– investment decisions based on different investment criteria according to CSR, sustainability reporting and GRI,

– application of financial tools and methods in the decision-making process of managerial finance.

Module content: Corporate Finance (financial tools and methods in decision-making, risk-return relationship, diverse financing alternatives using data from real financial statements); Financial Management (assessment of financial security and stability using different methods and tools, differences of assessment in various countries within forest-related industry); Managerial Accounting (controlling methods and tools, principles of controlling, CSR, SD reporting and GRI); Investment Management (evaluation of investment projects using diverse investment tools).

Before starting the course "Global Outlook of Forest Sector" (ECTS credits – 7, workload – 210, contact hours – 110, self-study – 60, exam preparation – 40) students should know the basics of Economics, Marketing and should be able to work with MS-Excel. Forest management and use of forest resources varies greatly across the world, depending on factors such as the forest area, standing volume, type of forests present in a country, local social and economic conditions, history, traditions and government policies both within and outside the sector. Furthermore, forest management and use continue to evolve over time in response to changes in these external factors as well as changes in the characteristics of the resource.

Main topics that are covered within the course:

– understanding and managing change in global forest sector with emphasis of sustainable development and sustainable forest management,

– changing context of global forest sector through sustainable development prism,
– impact of globalization on forest users,
– market and market forces for forest-related products,
– the forest sector with the environmental paradigm,
– capability development and strategic imperatives for forest sector.

Forest management is complex because forests can produce such a wide variety of goods and services. Many of these outputs can be produced simultaneously, but often there are also trade-offs between them, especially between the commercial and non-market outputs from forests. While the demands for these outputs varies between countries and over time, it is probably true to say that they are mostly increasing, leading to ever more complicated and difficult decisions for forest managers and policymakers wishing to satisfy these competing demands.

The next course is "Organizational Behavior" (ECTS credits – 8, workload – 240, contact hours – 120, self-study – 65, exam preparation – 55). Students should have basic knowledge in Management and be able to prepare PowerPoint presentations. The module is designed to provide students with the capability to manage different process in a diversified company's environment.

Main topics that are covered within the course:
– introduction to critical issues of managing human resources for companies both in domestic and in international environment, including CSR, Occupational Health and Safety (OHS) and WHS (Work Health and Safety),
– interpersonal communication skills, negotiation process, conflict management,
– challenges for managers dealing with such aspects as diverse workforce, productivity increase challenge, conflicts, motivation and loyalty,
– the importance of values for personal and companies success, awareness of ethical issues and moral values and their role company's development,
– the importance of schedules and planning in time management, self-management,
– how to benefit from diversity, gain effective team using different tools and techniques.

Module content: Human Resource Management (competitive companies require appropriate tools, methods, structures, policies and strategies for managing their employees at every level of the enterprise); Interpersonal Skills (managerial success depends on how well the manager relates to the team; how to influence others and ensure the message that has been sent is received as intended); Leadership and Business Ethics (ethical and moral values; personal vs. corporate values, codes of ethic/conduct, the role of ethics in leadership in forest-related industry); Time management and Teamwork.

Before starting the course "Value-added Chains (incl. Logistics)" (ECTS credits – 7, workload – 210, contact hours – 120, self-study – 60, exam preparation – 30) students should pass such courses as Industrial Marketing, Global outlook of forest sector, Management of production processes and basics of Finance. Students should be able to operate in MS-Excel and make Power-Point presentations. The module is designed to give students understanding that in the process of strategy developing and attempting to secure a competitive advantage, it is important to note that a firm is not simply a "black box" into which raw materials go and from which products emerge.

Main topics that are covered within the course:
– changing policies and strategic decisions,
– improving linkages among activities,
– altering market timing and production locations,
– establishing of stronger linkages between activities,
– development of relationships between business units,
– changes in the operations scale,
– addressing institutional factors such as regulation and product requirements.

Module content: Technology and the Value Chain; Relationships between Value Chain Activities; Control of Value Chain Activities.

The next course should be "Strategic Management" (ECTS credits – 8, workload – 240, contact hours – 120, self-study – 70, exam preparation – 50). Students should have successfully passed the program of the 1st semester to be able to participate in this module. The module is designed to give students understanding of organizational management activity that is used to set priorities, focus energy and resources, strengthen operations, and also ensure that employees and other stakeholders are working toward common goals.

Module content: Competitive Strategy (develop and implement corporate strategies using the data from operations management, marketing and financial management); Key-Performance Indexes (KPI), Balanced Score-card (BSC) and GRI in developing company's strategy (strategic methodologies and instruments; alternative strategic roadmaps, basic strategic techniques); Business Policy Corporate Strategy (strategic analysis, dynamic capabilities, key success factors).

Before starting the course "Business Planning" (ECTS credits – 8, workload – 240, contact hours – 120, self-study – 70, exam preparation – 50) students should have deep knowledge of Economics, Finance and Investment, Strategic Management, Industrial Marketing. They should be able to work with MS-Excel on the at least intermediate level. This module is designed to consolidate the previous modules. Different situations such as establishing a company and/or evaluation of business idea, decision-making within a company, buying and selling a company (business unit) are covered.

Main topics that are covered within the course:

– managerial thinking and making decisions under uncertainty and taking into account peculiarities of sustainable development imperative and forest products business,

– analysis of company's reports with further decision-making (including Sustainability reports and GRIs),

– evaluation of business ideas an setting up business plans,

– setting up a framework for successful establishment of new business in forest-related industry,

– application of discounted cash flow and capitalized earnings methods to evaluate of mergers and acquisitions (M&As) within forest-relate industry,

– developing practical approach to carry out M&As, assessing the key factors to successful M&As in forest-relate industry.

Module content: Business Simulation (practicing managerial thinking in case studies and business games for the forest products companies); Entrepreneurship (developing, substantiating and implementing business ideas in forest-related industry); Merges & Acquisitions (evaluation of key issues in mergers, acquisitions and strategic alliances in forest-related industry).

The final assignment after passing all obligatory courses is the Corporate Project (in the 3rd semester with 10 ECTS credits, 300 hours of workload all of which is self-study).

After completing theoretical and practical parts of the Master program students must prepare Master Thesis in the 3rd semester. 20 ECTS credits are given for the Master Thesis with 600 hours of workload, 540 of which is self-study and 60 are assigned for contact hours with scientific supervisor.

5. Conclusions

According to the result of the survey and discussions we can state that the Program should be designed primarily for students who are looking for careers as managers in the forest industry. The Program should be based on a strong background in business administration and aims at developing students' abilities to use analytical skills when solving real-world problems such as integrated resource management and sustainable development.

To complete the MBA in Forest-related Industries program, it is important to take a business strategy course (reflecting sustainable development issues), a business practicum/project internship.

The results of the survey, interviews and discussions with business representatives concerning their attitude towards MBA program in Forest-related industry

as well as its structure and content showed that the majority of proposed courses should include the environmental aspects. Reflection of sustainable development issues was considered important while conducting international business.

References

Baxter P., Jack S., 2008, Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers, *The Qualitative Report*, no. 13: 544-559.

Beggs B.A., Ross C.M., Knapp J.S., 2006, Internships in leisure services: An analysis of student and practitioner perceptions and expectations, *Schole: A Journal of Leisure Studies and Recreation Education*, vol. 21: 1-19.

Breen H., Hing N., 2001, Improving Competitiveness Through Cooperation: Assessing The Benefits of Cooperative Education Partnerships in Gaming Management, *UNLV Gaming Research & Review Journal*, vol. 6(1), http://digitalscholarship.unlv.edu/grrj/vol6/iss1/5 [1.10.2015].

Codd J., 2005, Teachers as 'managed professionals' in the global education industry: The New Zealand experience, *Educational Review*, vol. 57: 193-206.

Flemin J., 2012, *Partnerships and relationships in cooperative education: Are stakeholder perspectives aligned?*, http://acen.edu.au/2012conference/wp-content/uploads/2012/11/56_Partnerships-and-relationships-in-cooperative-education.pdf [6.11.2015].

Flemin J., Hickey C., 2013, Exploring cooperative education partnerships: A case study in sport tertiary education, *Asia-Pacific Journal of Cooperative Education*, vol. 14(3): 209-221.

GRI. An introduction to G4, 2013a, *The next generation of sustainability reporting*, www.globalreporting.org/resourcelibrary/GRI-An-introduction-to-G4.pdf [15.10.2015].

GRI. Interpretations on the G4 Guidelines, 2013b, www.globalreporting.org/resourcelibrary/GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures.pdf [23.09.2015].

Hase S., 1997, *Cooperative education partnerships: Australian universities in a turbulent environment* [unpublished doctoral thesis], Lismore: Southern Cross University.

Hing N., Breen H., 2002, Improving competitiveness through cooperation: assessing the benefits of cooperative education partnerships in gaming management, *UNLV Gaming Research and Review Journal*, vol. 6(1): 57-72.

Hyett N., Kenny A., Dickson-Swift V., 2014, Methodology or method? A critical review of qualitative case study reports, *International Journal of Qualitative Stud Health Wellbeing*, vol. 9: 23-60.

Maksymets O., Lönnstedt L., 2015, Trends in Markets for Forest-Based Products and Consequences for Selected Countries, *Open Journal of Forestry*, vol. 5: 697-710.

Marginson S., 1993, *Education and Public Policy in Australia*, Cambridge: Cambridge University Press.

Marginson S., 1997, Is economics sufficient for the government of education?, *New Zealand Journal of Educational Studies*, vol. 32(1): 3-12.

Martin A.J., Leberman S.I., 2005, Keeping up with the play: Practicum, partnership and practice, *Asia-Pacific Journal of Cooperative Education*, vol. 6(2): 17-25.

Merriam S.B., 2009, *Qualitative research: A guide to design and implementation*, San Francisco, CA: Jossey-Bass.

Patrick C.-J., Peach D., Pocknee C., Webb F., Fletcher M., Pretto G., 2008, *The WIL (Work Integrated Learning) report: A national scoping study*, Brisbane, QLD: Queensland University of Technology.

Powers D.R., Powers M.F., Betz F., Aslanian C.B., 1988, *Higher Education in Partnership with Industry*, San Francisco: Jossey-Bass.

Stake R.E., 1995, *The art of case study research*, Thousand Oaks, CA: Sage.

Thiel G.R., Hartley N.T., 1997, Cooperative education: A natural synergy between business and academia, *S.A.M. Advanced Management Journal*, vol. 62(3): 19-24.

Weisz M., Smith S., 2005, Critical changes for successful cooperative education, *Higher Education in a Changing World*, http://conference.herdsa.org.au/2005/pdf/refereed/paper_289.pdf [23.11.2015].

UN, 1992, *The Rio Declaration on Environment and Development*, www.unesco.org/education/nfsunesco/pdf/RIO_E.PDF [21.09.2015].

UN, 2015, *Transforming our world: The 2030 Agenda for Sustainable Development*, https://sustainabledevelopment.un.org/post2015/transformingourworld [21.09.2015].

Yin R.K., 2003, *Case study research: Design and methods*, Thousand Oaks, CA: Sage.

Poprawa konkurencyjności ukraińskiego przemysłu leśnego poprzez uwzględnienie aspektów zrównoważonego rozwoju w programie MBA dla leśnictwa

Streszczenie. W powszechnej świadomości stale rośnie znaczenie zrównoważonego rozwoju, a jego idee znajdują odzwierciedlenie w działaniach świata akademickiego, urzędów i przedsiębiorstw. Ponieważ niemożliwe jest osiągnięcie pożądanego poziomu świadomości tych zagadnień bez odpowiedniego kształcenia, konieczne jest kreowanie partnerstwa i współpracy na rzecz edukacji. Artykuł ukazuje rezultaty badania dotyczącego potrzeb w zakresie stworzenia i realizacji programu Master of Business Administration (MBA) przeznaczonego dla przemysłu leśnego na Narodowym Uniwersytecie Leśnictwa Ukrainy. Uwagę poświęcono też treści tego programu. Ustalono, że gromadzenie i upowszechnianie wiedzy na temat powiązań między trwałym rozwojem a biznesem służy samym przedsiębiorstwom, prowadząc do wzrostu ich wartości, pomagając w zarządzaniu zmianą i będąc motorem racjonalizacji i innowacji. Zważywszy na rosnący popyt na programy MBA, bardzo ważne jest uwzględnienie zagadnień zrównoważonego rozwoju w każdym nowo projektowanym kursie. Aspekty zrównoważonego rozwoju są bowiem istotne zarówno dla programu studiów MBA, jak i dla leśnictwa, a partnerska współpraca między szkolnictwem wyższym a przemysłem leśnym byłaby obopólnie korzystna.

Słowa kluczowe: partnerstwo i współpraca w edukacji, MBA dla przemysłu leśnego, zrównoważony rozwój w programie studiów MBA, biznes a zrównoważony rozwój, Ukraina

ANDREY NIKISHIN*

Wind Energy for Sustainable Development as Applied to the Kaliningrad Region of Russia: Technical Aspects

Abstract. Sustainable development means the shift towards the use of sustainable renewable energy sources. The development of wind energy is certainly one of the most successful examples of how to do this. Wind power engineering is the fastest developing branch of the global energy industry. In 2014, the world reached the highest level of new wind turbines installed, a capacity more than 51 GW. This means that the share of wind in total electricity production is increasing, reaching, in some countries, outstanding values (for example, 39% of total electricity consumption in Denmark in 2014). The total capacity of a new wind turbine is comparable with the biggest traditional electrical power plants and the total installed capacity of the energy system. However, it causes specific problems of interconnection, operation, and putting such installations in traditional energy systems with traditional energy sources. There are good chances that the Kaliningrad region energy system in the nearest future would have to go into isolate operation because of the disconnection of Lithuanian, Latvian, and Estonian energy systems from Russian networks. If that is the case, the development of wind energy in the Kaliningrad region could become one of the most attractive options for a sustainable future of power engineering.

Keywords: wind energy, sustainable development, energy system, mathematical model

1. Introduction

Wind power engineering – is the fastest growing sector of the world energy industry. The highest history level of the wind turbines annual installed capacity of more than 51 GW (Chart 1 and Table 1, GWEC 2015), was recorded in 2014.

---

  * Kaliningrad State Technical University, Russia, e-mail: andrey.nikishin@outlook.com, phone: 79 217 11 11 04.

Chart 1. Global installed wind capacity in 1997-2014, cumulative and annual
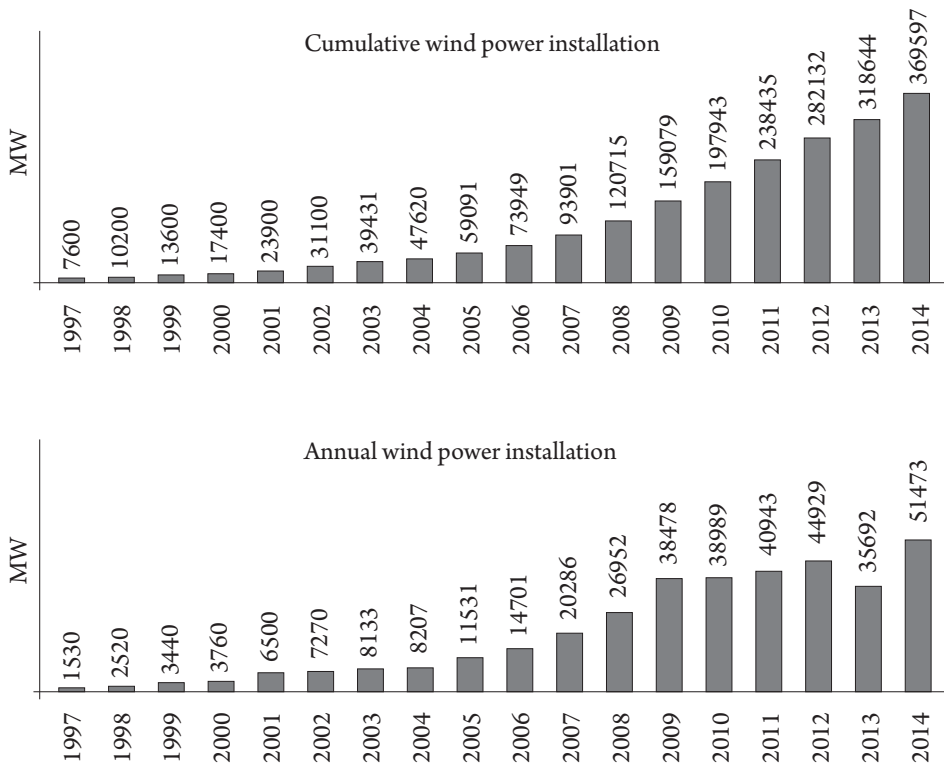
Source: GWEC 2015.

Sustainable development means the shift from the use of traditional fossil fuels towards sustainable renewable energy sources for the future decrease of CO_2 emissions. The development of wind energy is certainly the most successful example of how to ensure this (Table 1).

Table 1. Development of wind energy

Year	Wind power installed capacity, MW	Wind energy share in total electricity production, %	Reducing of CO_2 emissions as a consequence of using wind energy, %
2008	120 715	1,50	2,2
2013	318 644	3,35	4,3
2018	820 000	8,00	11,0

Source: Press Release 2009.

According to the global international project Wind Force 12, by 2020 12% of global energy production will be accounted for wind energy. In the existing electrical networks this share is a theoretical allowable limit to ensure the static stability of the energy system [Larsson 2002].

It turned out that in reality the growth of installed capacity is even higher than the forecast. For example, in Denmark wind power engineering produced 33% of total energy consumption in 2013 and 39% – in 2014. In 2012 the Danish government has approved a plan to increase the share of wind energy in electricity production of Denmark to 50% by 2020 and to 84% by 2035 [The Guardian 2012]. As mentioned above, it could become a problem for static stability of the Denmark power system in isolated operation, but Denmark has strong electrical connections with European Network of Transmission System Operators (ENTSO-E). The total installed capacity of wind turbines in Denmark is 4,89 GW which only gives us about 0,7% of the ENTSO-E Continental European Synchronous Area (677 GW of total installed generator capacity), so Denmark is still far away from the theoretical limit of wind energy utilization for the purposes of energy system.

One of the main reasons of such phenomenal development of wind power in the world is a constant decrease in the cost of 1 kW of installed capacity of a wind turbine (from 823 EUR/kW in 2002 to 566 EUR/kW in 2014).

2. Collaboration of wind energy and energy systems

An individual wind turbine capacity is constantly growing (4,5-7,5 MW), capacity of a wind power plant (WPP) becomes comparable to the capacity of the power grid (the largest is Gansu WPP 7965 MW, China). Therefore, projects for new wind power plants together with such important factors as wind potential assessment and environmental requirements will need assessment of possibilities of interrelation with the electrical grid. According to PTWE [2002] the work of wind turbines and wind power plants in electrical networks are affecting:
  – power quality,
  – increase of electrical equipment load,
  – short-circuit currents,
  – power and energy balance.
Without proper assessment of connection possibilities, a project for a new wind power plant can exceed the technical capabilities of the energy system at the connection point. It could only be done using proper static and dynamic math-

ematical models of wind turbines and energy system, which normally consist of the models of a wind turbine, transformer substation, transmission lines, consumer loads and energy system connection (Fig. 1). As a result, the model itself must be comprehensive and need experiment data for verification.
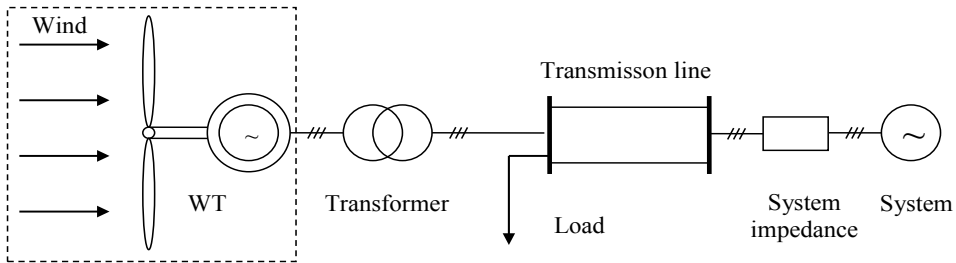
Figure 1. Block diagram of the model of the wind turbine connected to the energy system

Source: Beley & Nikishin 2011.

In Europe and North America regulations have been developed governing the procedure of such assessment. According to them, the assessment should be based on:
– ratio between the capacity of WT and short-circuit power of the energy system at the point of connection ($\geq 0,02$),
– complex calculation of power flows,
– voltage fluctuations in commutations,
– calculation of short-circuit currents,
– assessment of a flicker level and harmonics.

Table 2. Wind turbine and wind farm capacity limits for connection to electrical grids with different voltage levels

Voltage level of the electrical grid	Unom kV	Wind turbine (WT) capacity	Capacity limits, M
Low voltage	less than 1	small and middle capacity WT	up to 0,3
Middle voltage	from 1 to 35	middle and big capacity WT, small wind farms	2-5
Direct connection to a middle voltage grid		middle and big capacity wind farms and WPP	10-40
High voltage	more than 35	middle capacity wind farms and WPP	up to 100
Extra-high voltage	more than 220	big capacity WPP	more than 500

Source: PTD-Kompetenz 2002.

Basic recommendations on the necessary voltage level at the connection point of the energy system and capacity limits of the grid (Table 2) show us that wind farms with installed capacity comparable to the capacity of the energy system require high and extra-high voltage grids which are rarely available at the places with high wind potential.

3. Wind energy for sustainable future of the Kaliningrad region

There are no regulatory documents for connection of WTs to the energy system in Russia, but they could be developed on a basis of international standards. Total installed capacity of WT in Russia is 16,8 MW (69th in the world), but wind potential (technical capacities) is enormous: from 16 500 to 52 181 billions kWh/year.

For a variety of reasons the Kaliningrad region could be a good test site for the development of wind power engineering in our country. First of all, Russian biggest wind farm (5,1 MW, Photo 1) is situated in Kulikovo settlement of the Kaliningrad region.

Photo 1. Kulikovo wind farm in the Kaliningrad region

Source: http://golodranec.ru/gallery/album/archive/5586/IMG_2451.jpg [17.10.2015].

However, the second reason is much more important. According to the plans of ENTSO-E, within a few years the energy systems of Latvia, Estonia and Lithuania will be integrated into Continental European synchronous area ENTSO-E. It will leave the energy system of the Kaliningrad region in isolated operation (Fig. 2).
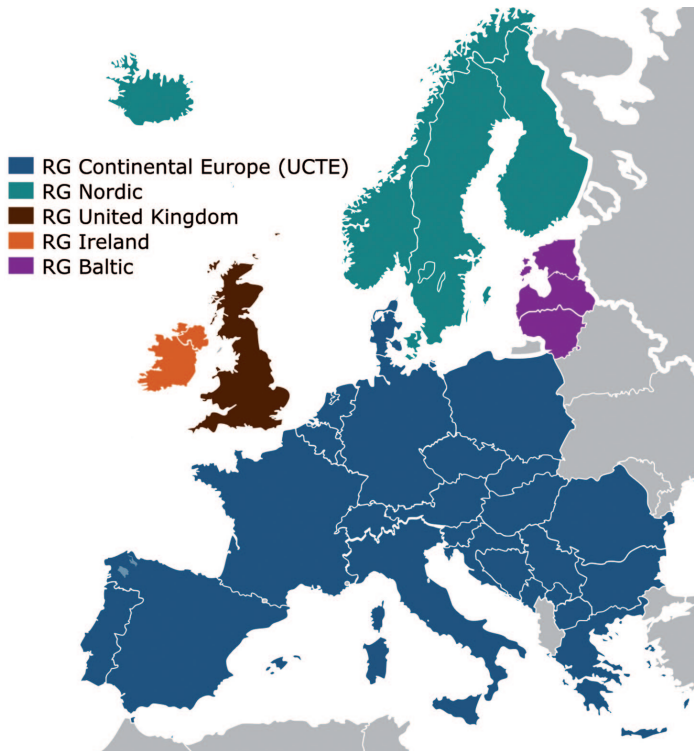
Figure 2. The Kaliningrad region in conditions of isolated operation

Source: www.snipview.com/q/European_Network_of_Transmission_System_Operators_for_Ele-ctricity [17.10.2015].

According to the long-term development programs for the electrical energy industry of the Kaliningrad region for the years 2014-2019, this problem should be resolved by means of building new power plants which will use traditional fossil fuels. At different scenarios, the installed capacity can be twice as much as the peak demand and can ensure the required control of active power.

At the same time we should mention that earlier research shows good perspectives for wind in the Kaliningrad region. During the INTERREG/TACIS project "Prospects for offshore wind energy development in marine areas of Lith-
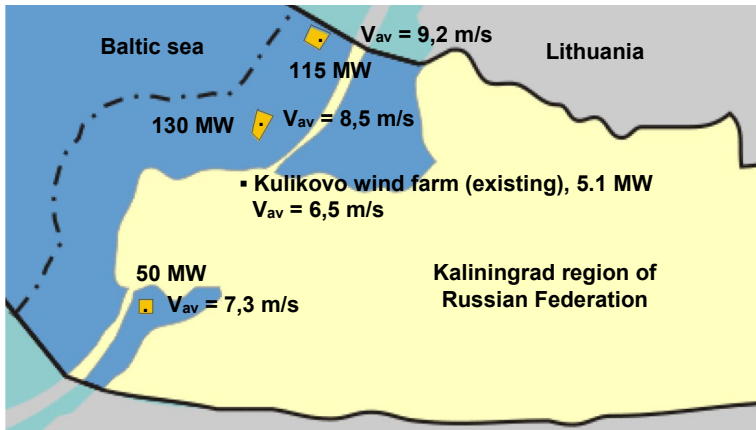
Figure 3. New installed capacities of wind turbines (orange areas) for sustainable development of the Kaliningrad region

Source: INTERREG/TACIS Project POWER 2005.

uania, Poland and Russia" (POWER) the most suitable places for wind turbines were defined (Fig. 3, orange areas)

Total electricity consumption of the Kaliningrad region in 2014 was estimated at 4531 mln·kWh. Preliminary calculations show that in order to ensure sustainable development of the region it is possible to produce almost 25% of total necessary electrical energy using new wind farms (Table 3).

Table 3. Assessment of annual average power generation of the existing and prospective wind farms in the Kaliningrad region

Wind plant capacity	Operation factor	Average wind speed, m/s	Number and type of WT	Production mln·kWh/year
50 MW (new)	0,33	7,3	25 × Vestas V-80	141,47
130 MW (new)	0,44	8,5	65 × Vestas V-80	471,01
115 MW (new)	0,49	9,2	58 × Vestas V-80	468,04
5,1 MW (existing)	0,19	6,5	20 × Vestas V-27 and 1 × Vestas W-4200/600	8,5

Source: own elaboration.

Considering that the total capacity of the energy system is expected to be less than 2200 MW by 2020, the theoretical limit of wind power utilization of 12% will not be exceeded. For preliminary calculations a math model can be used which was originally created for the assessment of Kulikovo wind farm regimes [Beley & Nikishin 2011].

4. Conclusion

The use of wind energy is the cheapest and the best known way to increase the share of sustainable renewable electrical energy sources in the Kaliningrad region, in Russia and world-wide.

It is no question that an increase of installed capacity a wind turbine creates new challenges for existing electrical energy systems, but we are still far away from possible theoretical limits of wind power utilization. Future use of new wind power plants in the Kaliningrad region can help to handle the problem of isolated operation of Kaliningrad electrical energy system, decrease of CO_2 emissions as well as increase sustainability of the region.

References

Beley V.F., Nikishin A.Ju., 2011, Vetrojenergetika Rossii: analiz nauchno-tehnicheskih i pravovyh problem, *Jelektrichestvo*, no. 7: 7-14.

Grid Capacity for Wind Energy Systems, Power System Software & Service, 2002.

GWEC, 2015, *Global Wind Energy Report. Annual Market Update 2014*, Bonn: Global Wind Energy Council.

http://golodranec.ru/gallery/album/archive/5586/IMG_2451.jpg [17.10.2015].

INTERREG/TACIS Project POWER, 2005, *Perspectives of Offshore Wind Energy development in marine areas of Lithuania, Poland and Russia"* Kaliningrad: TACIS responsible partner Atlantic Branch of Institute of Oceanology.

Larsson A., 2002, *The Power Quality of Wind Turbines* [PhD thesis], Goteborg: Chalmers University of Technology, Department of Electrical Power Engineering.

Press Release 2009, BTM Cosult ApS. International Wind Energy Development World Market Update 2009 Forecast 2009-2013, 25.03.2009.

PTWE, 2002, PTD-Kompetenz, *Gesamtlosung fur On-/Offshore-Winsparks*, 01.

The Guardian, 2012, *Denmark aims to get 50% of all electricity from wind power*, 26 March.

The programs of the Kaliningrad region electrical energy industry perspective development for the years 2014-2019.

Wind Force 12: Report of European wind association and Greenpeace.

www.windpower.org/en/knowledge/statistics/the_danish_market.html [17.10.2015].

Energia wiatrowa
na rzecz zrównoważonego rozwoju
na przykładzie Obwodu Kaliningradzkiego
Federacji Rosyjskiej. Aspekty techniczne

Streszczenie. Trwały i zrównoważony rozwój oznacza przesunięcie akcentu w kierunku wykorzystania odnawialnych źródeł energii. Rozwój energii wiatrowej jest z pewnością jednym z najlepszych przykładów udanych wysiłków na tym polu. Energetyka wiatrowa jest najszybciej rozwijającą się gałęzią energetyki na świecie. W 2014 r. moc znamionowa nowych turbin instalowanych na całym świecie osiągnęła rekordową wartość 51 GW. Oznacza to, że udział wiatru w ogólnej produkcji energii rośnie, dochodząc w niektórych krajach do naprawdę znaczącego poziomu (w Danii np. w 2014 r. z wiatru pochodziło 39% łącznego zużycia energii). Maksymalna moc nowej turbiny wiatrowej jest porównywalna z mocą największych tradycyjnych elektrowni i łączną mocą znamionową systemu energetycznego. Jednak w jej przypadku występują pewne problemy związane z przyłączeniem, eksploatacją oraz funkcjonowaniem takiej instalacji w tradycyjnej sieci energetycznej bazującej na tradycyjnych źródłach energii. Jest wysoce prawdopodobne, że system energetyczny Obwodu Kaliningradzkiego będzie musiał w najbliższej przyszłości przejść na samodzielne funkcjonowanie wskutek jego oddzielenia od sieci litewskich, łotewskich i estońskich. Jeśli tak się stanie, rozwijanie energii wiatrowej w Obwodzie Kaliningradzkim może być jedną z atrakcyjniejszych opcji z punktu widzenia zrównoważonej przyszłości tamtejszej energetyki.

Słowa kluczowe: energia wiatrowa, zrównoważony rozwój, system energetyczny, model matematyczny

Kristīne Bērziņa*

The Importance of Sectoral and Regional Cooperation Network Coverage for Sustainable Tourism Development in Latvia

Abstract. Sustainable tourism development concept defined by World Tourism Organization reveals a need for common network formation as a platform for cooperation between different tourism sectors and stakeholders. Additional reason for the growing interest in cooperation in tourism is the belief that organisations and destinations may be able to gain competitive advantage by bringing together and sharing their combined knowledge, expertise, financial capital and other resources for common goal. Cooperation networks can gain collaborative advantage not only for separate organisation, but the whole destination. Topicality of the problem is based on the global competition, heterogeneous nature of tourism industry, rapidly developing technological innovation, need for sustainable development set additional importance for cooperation in order to keep pace with the latest developments and new possibilities for cooperation networks. The aim of paper will discuss tourism industry sectorial and regional coverage of tourism associations and other formal networks in Latvia from the perspective of sustainable tourism destination development. Conclusions and suggestions are drawn for overall tourism industry as system development, cooperation network gap reduction by sectors as well as by regions and tourism organisation cooperation improvement in Latvia.

Keywords: tourism, sustainability, sustainable development, networking, cooperation, cooperation networks, regional coverage, sectoral coverage

1. Introduction

United Nations have recognised importance of partnerships in the Millennium Development Goals as well as recent Sustainable Development Goals (SDG) 2016-2030 thus stressing topicality of networking phenomena for sustainability securing. The 17th SDG goal comprises mechanisms and partnerships to reach

* University of Latvia, e-mail: kristine.berzina@lu.lv, phone: +371 67034718.

the sustainability as all SDGs are linked, for all the rest 16 SDGs linkage strengthening is via partnerships. Additionally topicality of networking from enterprise and organisation perspective – 21st century can be characterised as cooperation, network and alliance period in enterprise and organisation interactions. Even though the Porter's concept of competitive advantage [Porter 1985] has not lost the crucial importance, the additional type of advantage that is more and more frequently mentioned, is collaborative advantage – production of something unusually creative, meeting an objective, which no organization could have produced on its own and when each organization, through the collaboration, is able to achieve its own objectives better than it could alone [Vangen & Huxham 2013].

Collaborative advantage in case of tourism enterprises can be achieved either by two party cooperation activities or by several tourism enterprise networking actions. Large number of tourism enterprises involved in cooperation networks allows achieve goals that can not be achieved separately therefor coverage as indicator of number of enterprises involved in networking can be used as one of indicators for sustainable tourism development characterisation. The aim of paper will discuss tourism industry sectorial and regional coverage of tourism associations and other formal networks in Latvia from the perspective of sustainable tourism destination development.

2. Sustainability concept in tourism

A traditional visualization of sustainable development dimensions isVenn diagram in which social, economic, and environmental factors overlap so as to producesystem that is sustainable in that it is socially bearable, economically equitable, and environmentally viable. In sustainable tourism concept it is not possible to separate the three mentioned sustainability aspects as mainly private enterprise tourism industry, this is the economic aspect, is tourist movement and interaction with local people that is the social aspect, in ecological environment in destination as the environment aspect. In addition to havingmulti-stakeholder process for articulating goals and aspirations in sustainability approach, there has to be effective implementation of change on the ground [Logan 2015]. Multi-stakeholder influences as well as economic, social and ecological aspect impact on sustainable development create additional complexity for communities in destination development and risk of some of stakeholder exclusion.

Even though tourism is considered generally as unsustainable industry, tourists and tourism enterprises can play an active role to overcome the environmen-

tal issues because global environmental issues and adverse effect of these issues on nature has been increased. In addition, tourists and tourism enterprises need to be informed about natural surroundings. The concept of sustainability has been discussed for years and it is also adapted to tourism industry. Scientists have done considerable research about the issues of sustainability and evolution of sustainability in terms of tourism industry [Yuzbasıoglua, Topsakal & Celikc 2014], still us in many theories there is no universally accepted definition of sustainable tourism destinations [Lee 2001]. According to World Tourism Organization [UNWTO 2005] sustainable tourism can be defined as "tourism that takes full account of its future and current economic, environmental and social impacts, addressing the needs of the enterprises, visitors, local people and the environment". Figure 1 shows scopes of sustainable tourism definitions.
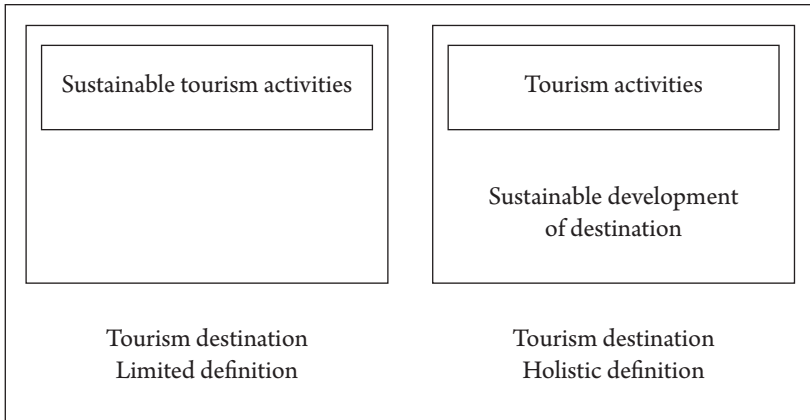
Figure 1. Definitions of sustainable tourism destination

Source: Lee 2001: 315.

Narrowed or limited definition includes the management of all sources that are devoted to tourism. On the other hand, holistic definition of sustainability has the potential to promotemore synergistic understanding of the social, environmental, economic and cultural indicators oftourism destination and how each of these factors lead tomore sustainable tourism destination [Lee 2001]. There are four indicators for implementing tourism strategies based on sustainability. These are local people; local authorities that responsible for the administration of destination; service-producing enterprises and finally visitors including excursionists and tourists [Buhalis 2000]. All the stakeholders – local people, local authorities, enterprises and visitors are responsible for the sustainability of tourism destinations. One of the more important models of sustainable development of tourism destination is DIT-ACHIEV Sustainable Tourism Model can be seen in

Figure 2. This model identifies the sustainable tourism indicators – administration, heritage, community, infrastructure, visitor and enterprises [Yuzbasıoglua, Topsakal i Celikc 2014], model describes influence of following elements as heritage include both archaeological, cultural and historical heritage as well as nature – flora, fauna, air. Infrastructure mainly comprises transport and amenities, that are enforced by tourism enterprise sustainable development practices. For community members the quality of there is very important in sustainable tourism perception. Destination visitors are seeking service quality, spending, still all stakeholders need to be managed by tourism administration policy management.

Heritage		Community
Infrastructure	Sustainable tourism	Visitor
Enterprise		Administration
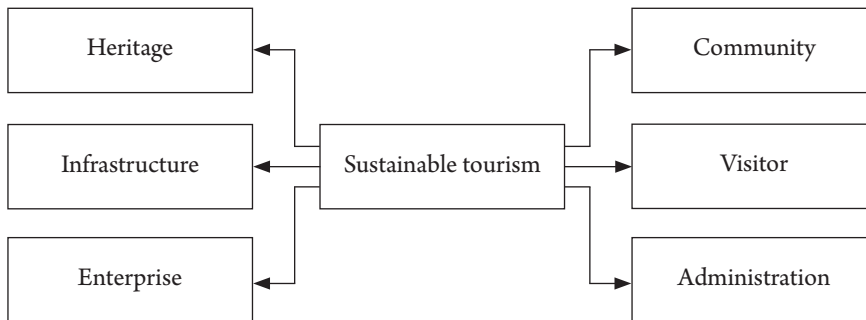
Figure 2. DIT-ACHIEV Sustainable Tourism Model

Source: Yuzbasıoglua, Topsakal & Celikc 2014.

The DIT-ACHIEV Sustainable Tourism Model realizes that tourism is an important for investment, revenue, and employment, it's indirect and direct impacts on sites such as the transport, environment, business, regional planning and trade mean that plan and policies must be integrated and coordinated to avoid one area of policy hindering the success of another. According to the model there are three roles of enterprises in sustainable tourism: sustainable practices, communication and labour [Yuzbasıoglua, Topsakal & Celikc 2014]. All stakeholder involvement and coordination support the Sustainable Tourism Model functioning in particular destination.

Tourism enterprises, especially, Small and Medium Enterprises (SMEs) that are dominating in tourism industry and making even up over 90% of the EU tourism sector, are nowadays facing many difficulties and threats to their survival. The economy globalization, the proliferation of large commercial or industrial chains, the inconstancy and mutation of the environment, and the economic crisis, are some of the variables that threaten the businesses [Varajao & Oliveira 2015]. Tourism enterprises face many pressures from the ever changing external environment, including economic, technological, social and political influence. High

competition has led companies to look for new approaches to take advantage, adopting new strategies and models that allow them to be able to meet the current development requirements. The search for increased competitiveness and efficiency of the last decade resulted in several organizational approaches. Some of these approaches rely on dynamically reconfigurable partnerships in permanent alignment with the market, and strongly supported by information and communication technology. The need for organizations is to adopt new organizational models in order to ensurepermanent adjustment to the market. These models should allow organizations to obtain enough wide dimension to act onglobal market and simultaneously ensure enough flexibility so that they can quickly adjust to new market requirements [Varajao & Oliveira 2015]. Innovative use of technological development allows faster organisational model adaptation.

Tourism is an activity that can havesignificantly big impact on sustainable development. Sustainability of tourism involves extensive cooperation between tourist companies, tourist destinations and national, regional and local authorities in order to coverwide group of challenges and at the same time to remain competitive [Angelkova, Koteski, Jakovlev & Mitrevska 2012]. Even thou for innovative approach the global cooperation perspective hashigh priority, it is not possible to exclude regional development as base for further globalisation processes.

3. Regional aspects of sustainability in tourism destinations

The encouragement of sustainable tourism in the regions is important not only tourists, but rather to locals and when they realize that the tourism development can take place insustainable way and they bepart of it and benefit, additional community support and local inhabitant attitude will create positive image of destination. Especially in the current condition of economic fluctuations and increasing unemployment, the possibility of the contribution of entrepreneurship to the reinforcement of employment renders it as an important parameter of destinations economic policy. The creation of new jobs and the reinforcement of employment of groups of the population, which are mostly affected such as youth, women, people with special needs, may attract additional positive contribution. This is where the cooperation networks can playsignificant role. By creating networks where local inhabitants cooperate for the common region development interest, destination can boost emotional attachment and relationship maintenance [Thipsingha 2015a, 2015b; Bitsani & Kavoura 2014]. Regional cooperation network development with local inhabitant involvement increase social capital of destination.

4. Interorganisational cooperation network concept

Broad cooperation definition comprises all forms of joint action by two or more individuals. More particular and narrowed definition describes cooperation as individual behaviour that incurs personal costs in order to engage injoint activity that grants benefits exceeding those costs to other members of one's group. Networking – one form of cooperation, it can be defined as set of enterprises and organizations incertain net with social, technologic, economic or other background. Networks comprise several enterprises have mutual objectives or common interests that serve as conjunctive link between these enterprises and organizations. Networks together with shared norms, values and understandings that facilitate co-operation within or among groups [OECD 2001].

In business cooperation networks inter-organisational relationships require several indications – at least three parties must have commercial relationship; that partners have some degree of independence, but at the same time depending on the type of network these isdegree of restriction of the enterprise freedom, and finally that management of the network is organised according to the strategic interests of the partners. Enterprise or organisation can be part of more than one network at the same time.

The establishment of cooperation networks between organizations appear to bestrategy for organizations to be able to develop common strategies that allow obtaining and maintaining competitive advantage. Engaging in new forms of collaboration and maintaining relationships within business networks have becomenatural way for organizations to meet performance requirements in competitive markets. In this way,cooperation network is an aggregator competence centre of the cooperation firms. Some of the most important criteria for competitiveness include responsiveness, agility, adaptability to environmental change, and high flexibility. The goal of the enterprise is to fulfil the customer requirements, but, traditionally, using the limited set of resources available within the walls of the organization. The interorganisational cooperation networks favours the competitiveness of the cooperating enterprises, as they become more flexible, minimize costs, share resources, skills and knowledge, define common strategies and still gain scale. Information Technology (IT) plays an important role as facilitator of setting up cooperation networks, supporting the development of alliances, allowing the creation of virtual organizations with other business partners and developing inter-organizational information systems that support strategic business relationships, with clients, suppliers, subcontractors and others. In the Information and Knowledge Era, the role of IT is fundamental to establish communi-

cating channels between cooperating networks. The correct adoption of IT in companies iskey factor for achieving superior business results and competitive advantages, being IT one of the main drivers of changes and innovations in corporations sharing information and knowledge about clients and potential business opportunities that each client could represent for the various members of the network. Companies can gaincompetitive advantage by using this information the various economic agents which cooperate on the network will be able to share information about the clients and business opportunities that each identify, in order to retain those same clients in the cooperation network. Consider, for example,business opportunity generated by the fact thatclient looks to stay for holidays inrural tourism house. This client is, or may represent, not only an opportunity for the network member who owns the house, but can also help to identify business opportunities for other members of the network, relating to guided tours, tasting of products, selling local crafts, among others. The system, beyond sharing information between cooperating agents, also allows clients to publish their own needs independently, i.e. without intermediation, which are real business opportunities for the cooperation network. The purpose of this kind of information sharing is to reduce the funding costs of new clients and offer complementary products and/or services. It should be noted that, in tourism sector, the demand tends to be cyclical, and as such, the model includes feedback, that is, the information shared by any of the cooperative agents may give rise tonew business opportunity later [Varajao & Oliveira 2015], that means the loyalty of local and international tourists can be managed also at the cooperation network level.

Taking asbasis for analysis the actors involved, cooperation networks can involve such sectors as partners: Private sector enterprises, Public sector organisations, Academic sector institutions. Researchers have applied the terms "network," "networking" and "clusters" to describe intangible linkages social structure and cooperation between entities, such as individuals, government organizations, non-government organizations and businesses [Tolkach & King 2014]. The two main grouping systems of network partners are based on Professional goal achievement or Regional gains.

An expanding regional coverage provides real opportunities for firstly targeted membership acquisition in the region, secondly for interlinking worldwide, region to region as well as within regions. Regional integration and cooperation arrangements vary widely in their structure, objectives, sectoral coverage, and membership. Cooperation is aimed less directly at trade and factors of production, and involves working together towardscommon end or purpose. Cooperation initiatives tend be more selective in their regional coverage and require less long-term commitment than integration [Radelet 1996]. Similarly, the broader is the sectoral coverage, the greater is the possibility that all members will en-

joy comparative advantage in some products. In more limited arrangements it is possible that countries with comparative advantage in excluded sectors such as agriculture will gain little, and may in fact lose from the RIA [Radelet 1996], therefore interoganisational cooperation needs to comprise different sectors of different industries.

5. Interogranisational cooperation specifics in tourism industry

Nowadays additional interest in collaboration in tourism has arisen attime of increasing environmental turbulence and operational complexity for organisations of all kinds and the transition to alternative forms of collaboration. Service, perishable good, global competition, increase of tourist experience – increase in requirements, tourism product – sellingdream, heterogeneous industry.

Tourism's multi-sectoral nature is marked by the fragmented or heterogeneous character of the industry. The heterogeneity of different tourism enterprises in the industry creates its specific system of interactions in the tourism-product chain of distribution. The operations of the intermediate-sector enterprises in the tourism industry are so active and multi channelled that they create additional challenges for the functioning of the industry. There are cases where several intermediates are involved betweensupplier of tourism products and the tourist him or herself.good example is the renting ofhotel room.hotel in Riga hascontract of sale withtravel agency in Riga; the room is further distributed via the travel agency to its partners in Stockholm, for example, who are Baltic tour operators, and these bigger agencies in Stockholm can work with other partners in Sweden that become the final sellers of this accommodation to the tourist.

6. Importance of regional coverage in tourism

Tourism network regional coverage provides set of different possibilities for tourism destination stakeholders, like:
  – attraction of tourists to the region using less investment per organisation,
  – closer cooperation of tourism enterprises of one destination,
  – specific problem solving in particular region,
  – formation of the regional products involving different tourism enterprise products, f.e. New rout development,
  – cooperation of public and private sector organisations,

    – possibility to access external funding,
    – regionalism at the time of the global economy and integration processes that are conditioned by it, becomes an inevitable factor of sustainable development of countries and wider regions [Milenkovic 2012].

On contrary consequences for partnership gaps in regional development are less information about the enterprises in more distant regions, secondly low tourism product diversity as well as decrease in tourist number.

Tourism enterprise and organisation network sectoral coverage provides possibility for:
    – common particular industry sector problem solving,
    – common industry sector problem lobbying,
    – fast information exchange,
    – best practices and experiences,
    – possibility to access external funding,
    – consequences for partnership gaps in tourism industry sectors can cause slow sector development as well as increase of expenses.

7. Study on tourism interorganisational cooperation networks in Latvia

Tourism development in Latvia is quite stable and even growing. In 2014, as compared to 2013, the number of foreign travellers has increased by more than 7%, 6.2 million travellers spent EUR 668.5 million in Latvia [CSB 2015]. What kind of companies generate these millions of euro? Tourism industry is very heterogeneous, that can be seen in Figure 3.

The tourism industry supply sector in Latvia mainly consists of SMEs – more than 500 accommodation establishments and 300 small country side guesthouses. Travel organiser sector contains at least 169 tourism companies according to the data of Central Statistical Bureau (CSB) of Latvia and even several times higher number according to the data of the Latvia Tourism Development Agency. Suchbig number of enterprises fordestination with only 2 million local inhabitants are quite high.

Comprising the data of Tourism Development Agency of Latvia (TDAL) as well as adding couple of networks that were not included in Agency data, author analysed the information on tourism networks in Latvia using secondary data (available data gathering) and primary data via expert interviews.

The range of cooperation networks during the last years is quite stable, even though previously some integration processes took place and some regional networks joined together forming bigger network system.

| **Accomodation sector**
Hotels, Guests houses, Farmhouses,
Apartments, Villas, Timeshares,
Vacation villages, Conference/
exhibition centres, Caravan/
camping sites, Marinas etc. | **Attraction sector**
Theme parks, Museums,
Wild life parks, Gardens, Heritage
sites, Art galleries etc. |

↑   ↑

| **Transport sector**
Airlines, Shipping lines, Railways, Bus/coach operators, Car rental operators,
Airports, Groun handlers etc. |

↑   ↑

| **Travel organisers sector**
Tour operators, Tour wholesalers/
brokers, Retail travel agents,
Conference organisers,
Incentive travel organisers etc. | **Destination organisers sector**
National, regional and local tourist
offices, Tourist associations etc. |

Figure 3. Basic tourism industry supply sectors

Source: UNWTO 2003.

Clustering the tourism enterprise cooperation networks we can see that the main dominating group are professional networks, so 2/3 from all cooperation groups, and the rest 1/3 are regional networks.

Professional networks in accommodation sector are formed between traditional hotels LVRA and other accommodation establishments – LC, LCA, HL. Every association represents specific accommodation types and do not overlap directly. So there is no direct competition between these sectors. Analysing Tourism industry cooperation network coverage in hotel industry sector Latvia, we can see the connection or positive correlation between the quality level and the participation in hotel network.

Networks in attraction sector – ALM, ALCMP were formed for museums, castles and manors. Transportation in tourism industry of Latvia is not separated from transportation in general, and there are no particular tourism related network groups. Destination information sector is supported by LATTURINFO gathering most of Tourism information bureaus.

Travel organisation sector is represented by one organisation ALTA. In travel organiser sector there is only one association. Calculating sectoral coverage rate

Table 1. List of tourism industry cooperation networks and their tourism industry represented sectors in Latvia 2015

Title of Tourism Industry Network in Latvia	Type of network	Tourism sector
Gauja National park Tourism Association	regional	complex of different tourism enterprises and organisations
Hostelling Latvija	professional	accommodation sector
Society "Kurzeme Tourism Association"	regional	complex of different tourism enterprises and organisations
Latgale Region Tourism Association "Ezerzeme"	regional	complex of different tourism enterprises and organisations
Latvian Ecotourism Society	professional	ecotourism
Latvian Camping Association	professional	accommodation sector
Latvian resorts association	professional	recreation
Latvian Rural Tourism Association "Lauku Ceļotājs"	professional	accommodation sector
Latvian Medical Export Association	professional	medical tourism
Latvian Museum Association	professional	attraction sector
Association of Latvian Castles, Palaces and Manors	professional	attraction sector
Association of Latvian Professional Guides	professional	tourism information sector
Latvian Association of Tourism Agents (ALTA)	professional	tourism organisation sector (intermediates)
Association of Latvian Tourism Guides	professional	tourism information sector
Association of Latvian Tourism Information Organisations LATTŪRINFO	professional	tourism information sector
Latvian Association of Tourism Education	professional	tourism education
Latvian Association of Hotels and Restaurants	professional	accommodation sector
LIVE Rīga Office	regional	complex of different tourism enterprises and organisations
Sigulda Region Tourism Society	regional	complex of different tourism enterprises and organisations
Society "Vidzeme Tourism Association"	regional	complex of different tourism enterprises and organisations
Zemgale Tourism Association	regional	complex of different tourism enterprises and organisations

Source: own elaboration.

based on data of CSB, the coverage percentage is average (Table 4), but adding the much bigger number by TDAL.

Tourism network regional coverage in Latvia, assmall country, is very integrated – there are four basic associations (corresponding to geographical – his-

Table 2. Tourism industry cooperation network type share Latvia 2015

Tourism Industry Networks (associations, societies)	Number of networks	Share of networks (%)
Regional networks	7	33,3
Proffesional networks	13	66,7

Source: own elaboration.

Table 3. Tourism industry cooperation network coverage in hotel industry sector in Latvia 2015

Tourism network sectoral coverage – hotels	5-star	4-star	3-star	1-2-star	Hotels
Latvia (together)	8	44	56	4	238
Latvian Association of Hotels and Restaurants	7	44	48	2	101
Hotel network sectoral coverage (%)	87,5	100,0	85,7	50,0	42,4

Source: own elaboration.

Table 4. Tourism industry cooperation network coverage in travel organiser sector in Latvia 2015

Tourism network sectoral coverage – travel organisers	Travel organisers
Latvia	169
ALTA	84
Travel organiser network sectoral coverage (%)	49,7

Source: own elaboration.

Table 5. Tourism industry cooperation network regional coverage in Latvia 2015

Tourism network sectoral coverage – regional coverage
Society „Kurzeme Tourism Association"
Latgale Region Tourism Association „Ererzeme"
LIVE Riga
Society „Vidzeme Tourism Association"
Zemgale Tourism Association

Source: own elaboration.

torical regions of Latvia) and the association of capital LIVE Rīga that's aim is to attract tourists to Riga.

Additionally to those basic regional networks there is one smaller region cluster.

8. Conclusions

The regional and sectoral cooperation network coverage analysis shows that there are no striking network gaps – there are cooperation networks in all tourism sectors, except tourism transportation. Tourism transportation cooperation is based on the overall transportation company cooperation with no cooperation specialisation in tourism. So the cooperation network representation we can characterise as existing in main tourism sectors. Still for each type of tourism organisations there is only one choice – to participate or not, that means that there is no competition between networks.

Similarly with regional coverage – all four basic regions of Latvia have their cooperation networks as well as capital of Latvia. Additionally to the basic region networks there are just couple of additional cooperation groups or clusters. Additional research can be done to study the differences in situation when there is competition between networks.

References

Angelkova T., Koteski C., Jakovlev Z., Mitrevska E., 2012, Sustainability and competiviveness of tourism, *Procedia – Social and Behavioral Sciences*, vol. 44: 221-227.

Bitsani E., Kavoura A., 2014, Host Perceptions of Rural Tour Marketing to Sustainable Tourism, *Procedia – Social and Behavioural Sciences*, vol. 148: 362-369.

Buhalis D., 2000, Marketing the competitive destination of the future, *Tourism Management*, vol. 21(1): 97-116.

Eggers F., Kraus S., Covin J.G., 2014, Travelling into unexplored territory: Radical innovativeness and the role of networking, customers, and technologically turbulent environments, *Industrial Marketing Management Journal*, vol. 43: 1385-1393.

Ford D., Gadde L.E., Hakansson H., Snehota I., 2003, *Managing business relationships*, London: Wiley.

Ford D., Mouzas S., 2013, The theory and practice of business networking, *Industrial Marketing Management Journal*, vol. 42: 433-442.

Lee K.F., 2001, Sustainable tourism destinations: The importance of cleaner production, *Journal of Cleaner Production*, vol. 9: 313-323.

Logan D., 2015, Sustainable Development Goal 17: Strengthen the global partnership, www.greenbiz.com [7.10.2015].

Milenkovic M., 2012, Ecoregionalism – Factor Cross-Border Cooperation and Tourism Development, *Procedia – Social and Behavioral Sciences*, vol. 44: 236-240.

OECD, 2001, *The Well-being of Nations: The Role of Human and Social Capital*, Paris.

OECD, 2008, *SMEs and Global Value Chains: Case Studies Findings, in Enhancing the Role of SMEs in Global Value Chains*, Paris.

Porter M.E., 1985, *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press.

Radelet S.C., 1996, *Regional integration and cooperation in Sub-saharian Africa*, Equity and growth through economic research.

Singh B., 2005, *Collaborative advantage in volatile business environments*, Western Reserve University.

TThipsingha S., 2015, Creating Network of Youth in Sustainable Tourism Development in the Greater Mekong Sub-region Case study: Nakhon Phanom,Thailand and Khammouan, Laos PDR, *Procedia – Social and Behavioral Sciences*, vol. 195: 1573-1582.

Thipsingha S., 2015, *Creating Network of Youth in Sustainable Tourism Development in the Greater Mekong Sub-region Case study: Nakhon Phanom, Thailand and Khammouan, Laos*, PDR UNWTO, Sustainable Development of Tourism, http://sdt.unwto.org/ [12.10.2015].

Tolkach D., King B., 2015, Strengthening Community-Based Tourism in a new resource-based island nation: Why and how?, *Tourism Management*, 48: 386-398.

UNWTO, 2003, *Cooperation and partnerships in tourism: Global perspective*, Spain.

Vangen S., Huxham Ch., 2013, Building and using the theory of collaborative advantage, in: *Network Theory in the Public Sector: Building New Theoretical Frameworks*, eds. R. Keast, M.P. Mandell, R. Agranoff, New York: Routledge.

Varajao V.M.J., Oliveira P., 2015, Cooperation Networks in the Tourism Sector: Multiplication of Business Opportunities, *Procedia Computer Science*, vol. 64: 1172-1181.

Yuzbasıoglua N., Topsakal Y., Celikc P., 2014, Roles of tourism enterprises on destination sustainability: case of Antalya, Turkey, *Procedia – Social and Behavioral Sciences*, vol. 150: 968-976.

Znaczenie zasięgu sieci współpracy branżowej i regionalnej dla zrównoważonego rozwoju turystyki na Łotwie

Streszczenie. Odnosząc się do koncepcji zrównoważonego rozwoju turystyki, Światowa Organizacja Turystyki (UNWTO) charakteryzuje ją jako „turystykę, która w pełni uwzględnia jej bieżący i przyszły wpływ na gospodarkę, społeczeństwo i środowisko, mając na uwadze potrzeby odwiedzających, branży turystycznej oraz środowiska i miejscowej ludności". Dostrzec bowiem można, że interesy i wizje rozwoju różnych grup zainteresowanych bywają ze sobą sprzeczne. Stworzenie wspólnej sieci pozwala na współpracę między poszczególnymi gałęziami turystyki i interesariuszami. Ponadto poprzez skoncentrowanie się na wspólnym celu oraz łączenie i wspólne wykorzystywanie wiedzy, kapitału finansowego i innych zasobów zarówno organizacje turystyczne, jak i poszczególne destynacje mogą zyskać przewagę konkurencyjną. Sieci współpracy mogą przynosić korzyści nie tylko poszczególnym organizacjom, ale i całym miejscowościom i regionom turystycznym. Wobec szybkiego rozwoju innowacji technologicznych i stale przyspieszających procesów globalizacyjnych animozje pomiędzy organizacjami turystycznymi ustępują

miejsca trwałym formom współdziałania, dla których sieci turystyczne są nie tylko zaczątkiem, ale też platformą informacyjną funkcjonującą w ramach sieci społecznych. Tematyka artykułu obejmuje globalną konkurencję, niejednorodny charakter przemysłu turystycznego, szybki rozwój innowacji technologicznych oraz konieczność dbania o zrównoważony rozwój, które nadają szczególne znaczenie współdziałaniu, warunkującemu umiejętność nadążenia za postępem oraz wykorzystywaniu nowych szans tkwiących w tworzeniu sieci współpracy. Celem artykułu jest omówienie branżowego i regionalnego zasięgu stowarzyszeń turystycznych oraz podobnych sformalizowanych struktur w łotewskim przemyśle turystycznym z perspektywy zrównoważonego rozwoju destynacji turystycznych. Wnioski i zalecenia dotyczą całego przemysłu turystycznego Łotwy, a należą do nich systemowy rozwój sektora, dalsze rozszerzanie sieci współpracy w poszczególnych sektorach i regionach, a także poprawa funkcjonowania współpracy pomiędzy organizacjami turystycznymi.

Słowa kluczowe: turystyka, trwały rozwój, zrównoważony rozwój, networking, współpraca, sieci współpracy, zasięg regionalny, zasięg branżowy

Alona Revko*

The Role of Human Potential
for Sustainable Development
in the Chernihiv Region of Ukraine

Abstract. The article deals with the basis that human potential development is the most valuable resource of any society. Empirical research has been carried out to determine what expenditures and population opinion influence the formation of the human potential. The author's definition of "modernization of the human potential" has been suggested. The impact of income and expenditure of the household on the qualitative improvement of human potential was examined. It was established that education is the most important component of human development which provides wider choices for a person, shaping the quality of life. Implementing the method of facilitating as a basic tool of informal education was determined to be one of the directions of modernization of the educational system in Ukraine. It has been proved that overcoming negative effects in the employment sphere, improvement of the wage policy, and the development of social infrastructure are the priorities of sustainable development of within a region.

Keywords: the human potential, modernization, modernization of human potential, wages, education, facilitating, social infrastructure

1. Introduction

In the context of a contemporary modernization paradigm, the essence of the development process for human potential is changing, for it occurs only at the level of spatial development for living and materialized labor in various spheres of its development.

Nowadays, there are real obstacles that actually impede qualitative development of human potential in Ukraine and do not provide opportunities to im-

* Chernihiv National University of Technology, Ukraine, e-mail: alohaha1984@mail.ru, phone: +38 066 719 67 90..

prove the welfare of households. Moreover, the existing living conditions do not correspond to global standards [Pustoviit 2013: 70].

Various aspects of development of the human potential in the context of the assignments of state regional policy are investigated both of native and foreign scientists [Becker 1964; Schultz 1961; Amosha 2012; Antoniuk 2009; Butko 2014; Libanova 2007; Makarova 2015; Semiv 2004 and others].

However, despite the importance of scientific achievement, the problems of determining the main priorities of modernization for human potential that influence sustainable development of the region are still very real.

The aim of the research is to study the main priorities of modernization of human potential in the context of sustainable development within the Chernihiv region (Ukraine).

2. Human potential – basis of national wealth

At the modern stage of the state's development, the human potential is the basis of national wealth and the most valuable resource of any society. Because the main criterion of social and economic innovations are the achievements in human's development and the satisfaction of his needs. The ability of the economy to use this potential effectively is manifested through the growing of gross domestic products and the improvement of the quality of life.

The problem of human potential was raised within the framework of the theory of human development in the 70s and 80s by a variety of foreign scientists such as G.S. Becker, M. Friedman, S. Fischer, and Th.W. Schultz.

Great contributions to the study of human development problems of the have been made the United Nations (UN). Within the United Nations Development Programme (UNDP) since 1990, annually publishes a World Report on the Human Development. "The 1997 Human development report," prepared by the United Nations Organization notes that "human potential represents different combinations of functional human qualities that someone can provide, and reflects the freedom of gaining these functional merits." At the same time "functional human qualities reflect useful features that the man provides himself, for example, to eat well, to live long or to participate in the life of the society" [Human Development Report 1997].

According to The Human Development Report 2015, work is intrinsic to human development. Work enhances development of the human potential, but of course some work damages human development and can even put workers at risk.

When positive, work provides benefits beyond just material wealth and fosters a great sense of community, knowledge, while strengthening communal dignity and inclusion. Nearly a billion workers in agriculture, 450 million entrepreneurs, 80 million workers in health and education, 53 million domestic workers and 970 million voluntary workers contribute to human progress.

When negative, such as in the form of forced labour, child labour and human trafficking, work can violate human rights, threaten freedom and shatter dignity [Human Development Report 2015].

Therefore, it is important to transform human potential in human capital which has economic effects. The idea of human capital can be traced back at least as far as the work of the 18th century Scottish economist Adam Smith, but it was predominately in the late 1950s and 60s that human capital began emerging as an important economic concept. At that time, economists such as Theodore Schultz began using the metaphor of "capital" – a longstanding concept in training from their employers. In modern economic research, human capital is understood to be the knowledge and skills that determine productivity [de la Fuente & Domenech 2006; Cohen & Soto 2007; de la Fuente & Ciccone 2003]. It was believed that only professionalism within the spehere of human potential could contribute to its capitalization.

Human potential is determined by the totality of characteristics that are integrated into such components (Fig. 1):

– social and demographic potential includes numbers of the population, gender and generation balance, the health condition and the duration of life and the level of educational of the population,

– social and economic potential which is represented in the level and structure of the economic activity and employment of the population, their qualification, their professional composition, the character and type of labor conditions, standards of living, the level of in-demanding and the use of intellectual resources,

– intellectual potential, which is realized in the sphere of innovative activities, business performance and the creative potential of individuals and opportunity towards their realization,

– socio-cultural potential, which depends on the state of science, education and culture. It's also determined by the particularities of the worldview and mentality of the population, their motivation, values and cultural integration within various population groups.

The developmental coordination of all these components of human potential, their mutual influence and connections with the economic dynamics has extremely important meaning to people it affects [Libanova 2007: 35-36].

In 2014 an empirical research study was conducted with the purpose of determining what expenditures towards the affectation on the population opinion, influence the formation of human potential and to determine the volume and
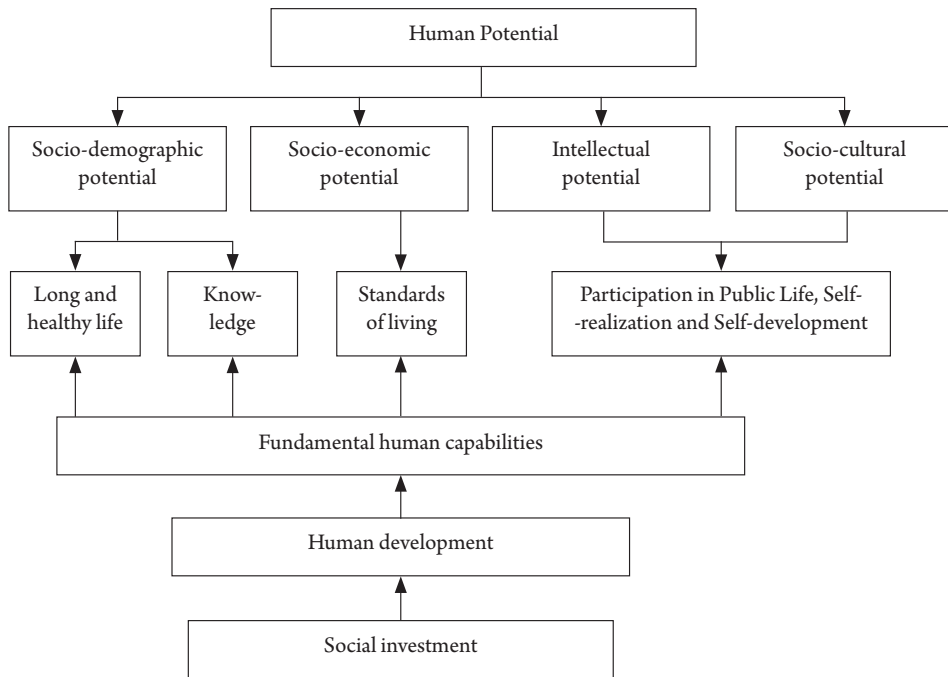
Figure 1. Parts of human potential

Source: Libanova 2007: 35.

structure of expenditure which are required to develop the full human potential of households.

Workers in different spheres of economics within the Chernihiv region of Ukraine (industry, trade, transport and communications, finance, education, health, public and personal services and agriculture) took part in the survey. The total number of respondents was 375 individuals.

The basic methodological tool of research was a questionnaire that included the following 4 main parameters (and consequently the blocks of questions):

1. The size of the household. An indicator of this parameter is the number of people (including the respondent) who live together in a living quarter, in whole or in part spend and have shared expenses.

2. The structure of expenditures of the households.

3. The amount of expenditure which is necessary for the respondent and his family to aid the development their human potential.

4. The purpose of the last block of the questionnaire was to give a self-assessment by respondents about the material well-being of their family.

A lot of respondents (69%) think that expenditures for the development of human potential rest solely on expenditures on food, clothing, footwear, housing

and other communal services. In addition, they don't give any value to other important expenditures such as education, theaters performances, museums, concerts, sports and payment for health services. This shows that our population has the distorting view about the human potential, the possibilities and ways of its qualitative development.

The vast majority of respondents think that the determinant of human development is only the satisfaction of the physiological needs. The investment in human development should be considered the expenditures to support and improve health, to get the qualitative education, to improve the level of culture. Education makes people more productive and health care saves investments in education and makes it possible to reproduce the human potential.

The concept of modernization of the human potential in the region is important for Ukraine because it is positioned with a human-centered approach that allows a person to be considered as an axial, backbone element of the market economy.

In the modern economic dictionary, the term "modernization" is interpreted as the introduction of improvements, which corresponds modern requirements; "modernization" - in general – this means the achievement of progressive changes, changes in certain objects in accordance with modern requirements by introducing various improvements. Modernization of the human potential of the region is qualitative of development the accumulated stock of physical and moral health of the population, their creative and civic potency, cultural and professional competence, which is implemented within various spheres of regional economic systems, and structures of the needs of the definite territory. Modernization of the spatial productive forces and especially human potential as their main components is ensured through effective regional social policy [Butko & Revko 2014: 42].

It is caused by the fact that most of the financial resources allocated for the development of general and professional education, healthcare, culture, housing and communal services and other social sectors are formed at the regional level [Antoniuk 2009: 71-72].

3. Labor market and possibilities of realization of human potential

Economic growth at the regional level is a process that on the one hand, characterizes the economic potential of the region and its economic power, but on the other hand reflects its capabilities and ability to solve social problems. It's not

coincidental that the support of sustainable and dynamic economic growth in the region is the main task and priority of regional policy.

According to the "The Strategies for Sustainable Development of Chernihiv region by 2020" the activities of democratic, civilized, European's authority should be focused on the human, rising of the human potential, improving the quality of life of every member of society.

It concerns too with the protection of the environment, taking care health concerns, providing education, living conditions, quality communal public and social services, comfortable urban environment, proper conditions for employment and many other components that the concept of quality of life includes [Stratehiia staloho rozvytku 2015: 78].

Currently, the process of implementation of the human-centered model is slowed down because of the situation in the labor market, low quality of education and provision of social services, decreasing investment capability of wages, private consumption and the spread of poverty. The only way out for Ukraine is on a stable trajectory of sustainable development that is both resolute and comprehensive in its reforms which are aimed at the increase of the public welfare and modernization of the human potential.

The main priorities of modernization of the human potential, which influence sustainable development of the region should be:
– overcoming the negative effects in employment sphere,
– improving of wage policy,
– developing of social infrastructure (Fig. 2).

The sustained decline of the unemployment rate which is accompanied by recovering of the labor market and reducing of long-term unemployment is inherent for the labor market in Chernihiv region.

However, there are a number of significant systemic flaws that keep under effective dissemination of positive social effects of economic development:

1. The ineffective structure of employment. There is still a significant number of the simplest professions within the structure of the employed of the Ukraine's population (23.4% in 2012); while the share of highly technical professionals and specialists in the structure of employment remains low (respectively 14.8 and 11.2%). Conservation of the industrial structure of employment within Ukraine is in contrast to innovative and intellectually oriented careers, which is typical for economically developed countries, but complicates the growth opportunities of an innovation role for human potential and basis for the improvement of human capital.

2. The inconsistent development of the labor market in comparison with the education sphere is a problem. The economy of the Chernihiv region is characterized by educational and qualification imbalances between the demand and the supply on the labor force.
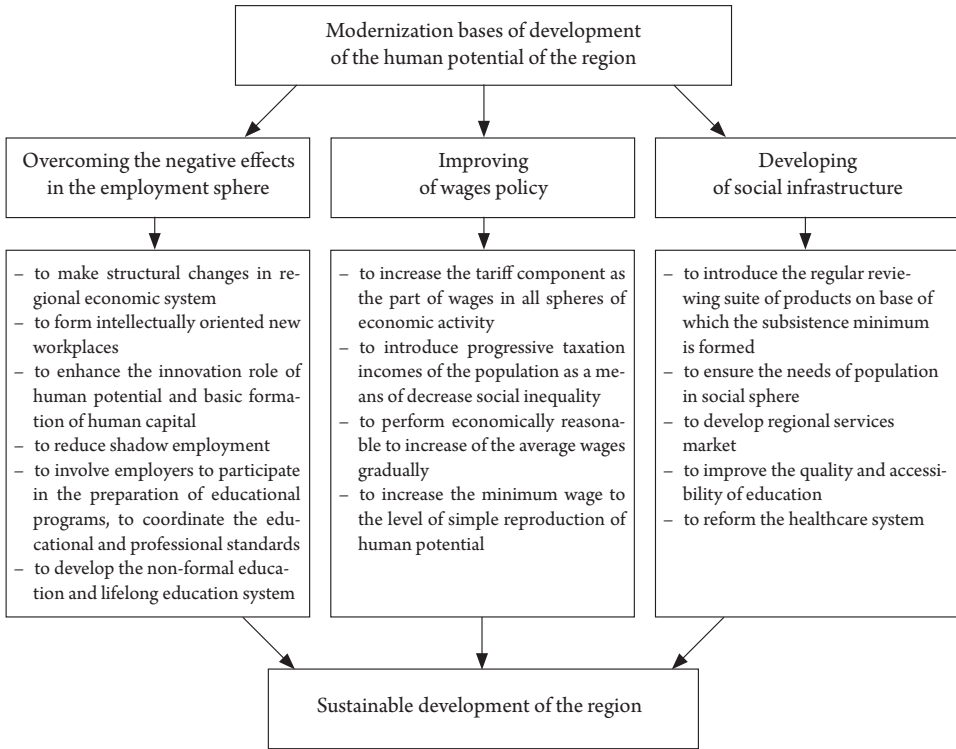
Figure 2. The main principles of modernization of the human potential of the region

Source: own elaboration.

The imbalance of available jobs offers (on the part of the enterprises) in specific professions with the volume of demands (on the part of the educational institutions) leads to the reduction of the volume and quality of employment. This is due to the discrepancy between the job title and the level of qualifications. Consequently, the necessary conditions for the transformation of human potential in human capital are not created. Only professionalism in use of human potential contributes to its capitalization.

3. A significant proportion of informal employment, mainly – in agriculture and in construction, trade, repair of cars, activities of hotels and restaurants has persisted. The development of the private sector is realized not only through the creation of a civilized system of small and medium businesses, but also through the redistribution of population in informal employment.

The lack of effective reforms, combined with large-scale shadow economy (so called "black economy") is reflected in the level of employment of the Ukrainian

population of 20-64 years old. In 2013 it included 67.4%, which is rather good by European's standards (max – 79,5%, in Iceland; min – 43 3%, in Greece). However, with 19,840 thousand employees in 2013 only 77.8% were working in officially registered sector. Employment in informal workplaces does not guarantee appropriate levels of social protection, does not provide acceptable wages and opportunities for development of the human potential [Analitychna dopovid 2014: 92].

The withdrawing of the material interests of many people (especially young people) in the "shadow economy" distorts the labor motivation, social and professional orientation and leads to the changes in the system of personal values.

The shadowing of the labor market has become the essential factor that deforms and weakens the effectiveness of state income policy. The existence of large scale shadow employment undermines the system of social support, weakens the efficiency of reform of the social programs and violates the principles of social equity in the distribution of social assistance, making social assistance too burdensome for the budget [Pro vnutrishnie... 2013: 96, 99].

According to the 2030 Agenda for Sustainable Development, which was adopted on September 25th 2015, at the United Nations in New York, one of the directions to overcome the negative phenomena in employment sphere and to promote employment is to get decent work, promote entrepreneurship and ensure inclusive and equitable quality education while promoting lifelong learning opportunities for everyone.

Based on the logical concept of human development, the priority direction of employment policy should be the emphasis of growth within the innovation role of human potential as the basis of the forming of human capital. It is this principal position as the active participation of every individual in the expansion of human capabilities. The economic activity, in the other words - participating in the labor market, is one of the main forms of participating in the public life that provides not only economic growth and material prosperity, but also wide opportunities for socialization and satisfaction of spiritual needs of human. In this way, the possibility of human potential realization has not only an economic effect but also belongs to various human needs which can be considered a manifestation of freedom [Libanova 2008: 258].

The main directions of overcoming the negative effects in employment sphere by 2020 should be:
  – to make structural changes in regional economic systems,
  – to form new intellectually oriented workplaces,
  – to enhance the innovation role of human potential and the basic formation of human capital,
  – to reduce shadow employment, to strength control of labor legislation,

– to evaluate the overall need in the workplace and to strength the market of trained professions,

– to involve employers to participate in the preparation of educational programs, to coordinate the educational and professional standards,

– to develop non-formal and lifelong education systems (Fig. 2).

4. Wages as a determinant of reproduction of human potential

The most negative impact on human potential has such indicators as:

– reduction in volume and quality of employment, which is due to discrepancy between the post and the level qualifications, experience and possibilities of the employee,

– decline in the quality and accessibility of education,

– the growth of the regional wage differentiation, leading to the marginalization of the population.

During last couple of years, purposeful activities aiming to improve the wage system and increase living standards were carried out by state authorities. However, the wage policy in our country does not create the necessary conditions for development or even for satisfaction of basic human needs.

The results of empirical research support that the main determinant of development of the human potential is wages. But, most of the income (55.6% in 2013) households earn is spent on foodstuffs [*Vytraty i resursy...* 2014: 137]. Let's compare, the United States direct 10% of family budgets on the foodstuffs, EU countries – 15%, the UK – 11.5%, Greece – 21.1%, Poland – 30%.

The lowest level of wages in Ukraine in 2013 was observed in the Chernihiv region – 2504 UAH or 313 USD (on 28-24% less than the national average). In addition, there is a significant gap between the minimum and maximum level of the average monthly wages in the country. The ratio between the highest wages in Kyiv (5007 UAH or 626 USD) and the smallest in Ternopil region (2359 UAH or 295 USD) is a factor of 2.1 times.

Differences in the size of wages are the result of structural differences in the regional economy. Regional wage differences create complicated problems in the ensurement of single national standard of life for the population, overcoming poverty and the development and formation of the middle class in this country [Novikova, Amosha, Antoniuk et al. 2008: 259].

The ineffective principles of using of the country's human potential have a negative impact not only on the organization and structure of employment, but

also on the development of business activity in the regions of Ukraine. It can be demonstrated by the decreasing average number of staff workers in Ukraine from 10,779.3 thousand people in 2011 to 10,348.3 thousand in 2013. Of course, the part of the fired workforce realizes its labor potential as a "called-in" employee or temporary hired-labor in different small-scale enterprises or start engaging in its own business. On the other hand, it proves that the efforts of the state in the creation of the new workstations do not work.

It should be noticed, that the standards of living of the population in Ukraine lags far behind the European and other developed countries. It's caused by significantly worse conditions for the development of human potential in Ukraine. The low wages and the consequent poverty of the working population have become a major barrier to economic development.

The nominal wages (in dollar equivalent) in Ukraine in the period of 2000-2013, has been increased approximately ten times (Table 1).

The increase of this indicator has occurred in all European countries from 2.4 times in Poland to 12.0 times in Russia. However, the average monthly wages in Ukraine is significantly lower than in other European countries. As a result, the population of Ukraine is forced to spend their penny-ante wages on goods and services price of which is almost approached to the world's.

An essential factor that deforms wages policy is taxation. In fact, there is a flat tax rate schedule in Ukraine. It contributes to injustices and the uneven distribution of the tax burden whereby the main taxpayers are from the medium and low-income groups. There is a progressive scale in the majority of developed countries which allows the main tax burden shift to the more affluent strata of the society. Thus, the principle of progressivity guarantees the leveling of income (Pro vnutrishnie ta zovnishnie stanovyshche Ukrainy, 2013: 100).

Table 1. Dynamics of average monthly wages in some European countries (in dollar terms)

Country	Years						
	2000	2005	2010	2011	2012	2013	2013 to 2000, times
Belarus	67.2	215.3	415.4	366.3	449.1	579.0	8.6
Bulgaria	107.2	207.8	434.8	496.1	506.5	543.0	5.1
Czech Republic	371.3	847.8	1291.2	1438.4	1326.0	1291.0	3.5
Hungary	371.8	931.6	1083.5	1207.4	1113.8	1124.0	3.0
Poland	494.1	791.4	1067.1	1148.2	1083.1	1165.0	2.4
Romania	133.3	327.1	597.4	667.2	614.8	673.0	5.1
Russia	79.0	302.5	698.5	806.4	866.6	947.0	12.0
Ukraine	42.3	157.3	283.1	331.2	379.4	410.0	9.7

Source: calculated on the data of remuneration labour of the United Nations, http://w3.unece.org [2.03.2016].

The problem of unreasonably low wages which is inconsistent with high responsibility and high intensity of labor activities is perceptible in Ukraine. This leads to the dropping levels of labor prestige, to the decrease of invested workers and organizations and institutions with less effective labor activity and professional growth; all of which leads to migration ("brain drain" phenomena), which has reached large proportions. Thus, the human potential, which was formed in our country, doesn't work in the favor of the national economy but for foreign employers.

In the current time the most important steps for the wage policy sphere are:

– to increase the tariff component as the part of wages in all spheres of economic activity;

– to introduce progressive taxation of incomes of the population as a means of decrease social inequality;

– to perform economically reasonable increase of the average wages;

– to increase the minimum wage to the level of simple development of human potential.

5. Social transformations for human development

During the recent years, ambiguous transformations in the social sphere of the region can be traced. The positive changes are an expansion of the sphere and types of services, diversified forms of property in objects of social purpose and the activation of competition. Negatives ones are manifested in inadequately growth of prices for services in compliance with the level of income of the population and the reduction of real wages for social sector employees and unreasoned transfer to communal ownership of social and cultural facilities. These ones were on the balance sheet of the enterprise, and the absence of clear prospects for their financing at least at the level of the minimum requirements has led to the reduction of the network and has reduced the availability of appropriate services for general part of the population.

One of the key problems of modernization of the human potential is the minimum wage, which appears to be the criterion for the formation of the level of wages and social benefits.

It is still determined on the basis of the sets of foodstuffs, non-food goods and services, approved by the government in 2000, but it does not provide even the basic physiological and social needs of the family.

The cultural measurement of the regional development is the part of a wider strategy of state policy which is aimed at modernization of the human potential.

The revival of the local communities as the cultural units is one of the important tasks of the culture development. Unfortunately, sociocultural factors are underestimated in the formation of state programs for regional development.

The methodical and systematic work on the revival of cultural and humanitarian potential of the communities will promote and overcome regional disproportion and will form the integral humanitarian space.

The purposeful, extensive, comprehensive support of the children's and teenager's art, and the pre-school and school education systems are necessary strategic investments in human potential and those people who will build and develop Ukraine during the next decades.

Education is a very important component of human development that provides increased welfare and choice for a person, shapes the quality of life [Makarova 2015: 163].

The strategic direction for the development of modern secondary education is ensuring its quality and basis of welfare and human health, as education is an indicator of the successful country, and the citizens' welfare. The introduction of human-centered education promotes the new understanding of educational quality. The quality education should match both social needs and diverse demands of the personality, take into account the individual propensities, abilities, interests in order to form the capacity for cooperation, lifelong learning opportunities, and to educate humanity, tolerance, responsibility with respect to people, nature, society and state.

Innovative development of the society requires the modernization of the educational environment, including its saturation of modern information and communication means, providing wide access for students and teachers to information resources, while introducing innovative educational technologies in teaching practices while widely using the approaches and methods that are based on new technologies of the open education [*Pro vnutrishnie...* 2013: 160, 162].

One of the directions of modernization of the educational system in Ukraine is the introduction of facilitation as the method of non-formal education. The facilitation, when it is used properly, activates the need for self-development, personal growth and constant self-improvement and self-realization in modern society. Non-formal education has huge potential because this form can react more flexibly on the new needs and can offer to the educational system and labor market the necessary points in terms of time, content and organization of education.

However, there are still many unsolved problems in the sphere of education. Their presence is inherited from Soviet times paradigm of education, which reduces significantly the opportunities for personal development.

Among the main problems of higher education institutions should be mentioned:

– the disequilibrium in the volume of preparation for individual specialties with prospective labor market needs in the future that could complicate the situation of employment;

– the violation of partnerships with companies, organizations and higher education institutions. Employers do not participate in appropriate professional practices ensuring the preparation of young people;

– the prestige of teaching and doing scientific work has decreased. This is due to the limited financing of education and science of the state and local budgets. As a result, the promising creative young and experienced teachers and researchers go to other industries and abroad [Analitychna dopovid 2015: 21-22].

Moreover, nowadays in Ukraine the quantitative and qualitative parameters of training professional staff do not fully meet the needs of economic and public development, as the structure of staff who have higher education by specialties is not optimal.

For example, in comparison with the averaged data in Germany, the UK and France, Ukraine lags behind the share of graduates of educational areas: scientific and natural (in 2.4 times), humanitarian and artistic (in 2.8 times), health and of social protection (in 3.6 times). However, Ukraine prepares many specialists in agricultural (4 times more than the average in specified countries) and in social sciences, business and law (44% of all graduates which is unreasonably high percentage).

This structure of professional training complicates the implementation of innovative changes in the economy. Moreover, it is not focused on the development of human potential. As a result, the proportion of graduates (18.7%) has reached a maximum value since independence among the active unemployed population but the national economy has not acquired innovative characteristics.

The main directions of the development of social infrastructure in Chernihiv region should be:

– the introduction of the regular reviewing suite of products on base of which the subsistence minimum is formed,

– the protection of basic needs of population in social sphere, in particular through infrastructure development (objects of social, cultural, community purpose, housing space),

– the development of regional service markets,

– the improvement in the quality and accessibility of education,

– the reforming of the healthcare system to ensure equal and fair access to all members of society to health services of good quality.

6. Conclusion

The direction of our country for integration into the European community requires new approaches towards the use of economic tools and especially the development of human potential in order to achieve a qualitatively new level of life and sustainable development of the Ukrainian society.

The current state of human development requires development within the Concept of preservation of the human potential of the region, the main idea of which is the determination of the quality of development of the human potential in policy documents as the primary resource of sustainable development of the region and the state.

The importance of providing proper living conditions for the population at the regional level causes the necessity of forming an effective economic mechanism from which can provide modernization of the development of human potential in order to stimulate sustainable development of regions.

References

Analitychna dopovid Natsionalnoho instytutu stratehichnykh doslidzhen do pozacherhovoho Poslannia Prezydenta Ukrainy do Verkhovnoi Rady Ukrainy "Pro vnutrishnie ta zovnishnie stanovyshche Ukrainy u sferi natsionalnoi bezpeky," 2014, Kyiv, NISD, Ukraine.

Antoniuk V.P., 2009, Sotsialnyi ta innovatsiinyi rozvytok rehioniv yak umova pidvyshchennia yikh konkurentospromozhnosti, in: *Rehionalni problemy liudskoho ta sotsialnoho rozvytku*, zb. mizhnar. nauk.-prak. konf., Donetsk, NAN Ukrainy.

Becker G.S., 1964, *Human Capital*, New York: Columbia University Press.

Butko M., Revko A., 2014, Metodolohichni zasady otsinky vplyvu zarobitnoi platy na vidtvorennia liudskoho potentsialu rehionalnoho sotsialno-ekonomichnoho prostoru, *Ekonomist*, 5: 42-45.

Cohen D., Soto M., 2007, Growth and human capital: good data, good results, *Journal of Economic Growth*, 12(1): 51-76.

Fuente A. de la, Ciccone A., 2003, *Human capital and growth in a global and knowledge-based economy*, Luxembourg: European Commission, DG for Employment and Social Affairs. Office for official publications of the European Communities.

Fuente A. de la, Domenech R., 2006, Human capital in growth regression: How much difference does quality data make?, *Journal of the European Economic Association*, 4(1): 1-36.

http://w3.unece.org [2.03.2016].

Human Development Report 1997, Oxford: Oxford University Press.

Human Development Report 2015, http://report.hdr.undp.org/#one [17.10.2015].

Libanova E.M., 2008, *Liudskyi rozvytok v Ukraini: innovatsiinyi vymir* [The human development in Ukraine: innovative dimension], Kiyv: In-t demohrafii ta sotsialnykh doslidzhen NAN Ukrainy.

Libanova E.M., 2007, *Liudskyi rozvytok rehioniv Ukrainy: analiz ta prohnoz* [The human development of the regions of Ukraine : analysis and forecast], Kyiv: In-t demohrafii ta sotsialnykh doslidzhen NAN Ukrainy.

Makarova O.V., 2015, *Sotsialna polityka v Ukraini* [Social policy in Ukraine], Kyiv: In-t demohrafii ta sotsialnykh doslidzhen im. M.V. Ptukhy, NAN Ukrainy.

Novikova O.F., Amosha O.I., Antoniuk V.P. et al., 2012, *Stalyi rozvytok promyslovoho rehionu: sotsialni aspekty* [Sustainable development industrial region: social aspects], Donetsk: NAN Ukrainy.

Novikova O.F., Amosha O.I., Antoniuk V.P. et al., 2008, *Liudskyi potentsial: mekhanizmy zberezhennia ta rozvytku* [The human potential: mechanisms for the preservation and development], Donetsk: NAN Ukrainy, Instytut ekonomiky promyslovosti.

Pro vnutrishnie ta zovnishnie stanovyshche Ukrainy v 2013 rotsi (2013), Shchorichne Poslannia Prezydenta Ukrainy do Verkhovnoi Rady Ukrainy, Kyiv: NISD.

Pustoviit R.F., 2013, Priorytetni napriamy vdoskonalennia instytutsiinoho seredovyshcha rozvytku liudskoho potentsialu v Ukraini, *Finansovyi prostir*, 1: 70-81.

Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning, Official Journal of the European Communities, European Parliament, Council of the European Communities, 2008, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2008:111:0001:0007:EN:PDF [17.10.2015].

Schultz T.W., 1961, Investment in Human Capital, *The American Economic Review*, no. 1: 38-56.

Semiv L.K., 2004, *Rehionalna polityka: liudskyi vymir* [Regional policy: human dimension], Lviv: IRD NAN Ukrainy.

Stratehiia staloho rozvytku Chernihivskoi oblasti na period do 2020 roku, 2015, Chernihiv.

Vytraty i resursy domohospodarstv Ukrainy u 2013 rotsi, 2014, statystychnyi zbirnyk, Kyiv: Derzhavna sluzhba statystyky Ukrainy, Ch. 1.

Rola kapitału ludzkiego w zrównoważonym rozwoju ukraińskiego Obwodu Czernihowskiego

Streszczenie. Tematem artykułu są podstawy rozwijania kapitału ludzkiego jako najbardziej wartościowego zasobu każdego społeczeństwa. W celu ustalenia, jak poziom wydatków i opinia społeczna wpływają na tworzenie kapitału ludzkiego, przeprowadzone zostały badania empiryczne. Zaproponowano też autorską definicję „modernizacji kapitału ludzkiego". Przeanalizowano wpływ dochodów i wydatków gospodarstw domowych na jakościowy wzrost kapitału ludzkiego. Ujawniono, że najważniejszym czynnikiem rozwoju społecznego jest edukacja, gdyż poszerza ona zakres wyborów dostępnych jednostce i kształtuje jakość jej życia. Stwierdzono, że wdrożenie

metody facylitacji społecznej jako podstawowego narzędzia edukacji nieformalnej powinno być jednym z kierunków modernizacji ukraińskiego systemu szkolnictwa. Udowodniono ponadto, że priorytetami zrównoważonego rozwoju w Obwodzie Czernihowskim winny stać się: przezwyciężenie negatywnych zjawisk w sferze zatrudnienia, poprawa w dziedzinie kształtowania zarobków oraz tworzenie infrastruktury społecznej.

Słowa kluczowe: kapitał ludzki, modernizacja, modernizacja kapitału ludzkiego, zarobki, edukacja, facylitacja społeczna, infrastruktura społeczna

Discussions, Reviews, Good Practices

ALLA PAKINA*

Education for Sustainable Development: Experiences of the Department of Environmental Management of the Lomonosov Moscow State University

Abstract. Today, education is as a key factor of sustainable development. The fundamental concept of the Department of Environmental Management, a unit of the Faculty of Geography, is the fact that the Earth is the only place known to sustain life. Education for sustainable development at the Department of Environmental Management is based on Faculty traditions and incorporates elements of both physical and human geography. The educational program reflects rapid development of the world – it becomes more complex and technologically advanced. Traditional and innovative aspects of education for sustainable development implemented at the Department of Environmental Management are considered in this article.

Keywords: high school, education, sustainable development, environmental management, interdisciplinary learning

1. Introduction

Education is a crucial factor on a way towards sustainable development. The growing importance of education for sustainable development (hereafter referred to as SD) was highlighted by the Declaration of the UNESCO World Conference on Education for Sustainable Development (hereafter referred to as ESD) held in November 2014 in Aichi-Nagoya (Japan). The call for "urgent action to further strengthen and scale Education for Sustainable Development" mentioned in the Declaration (Aichi-Nagoya Declaration... 2014), reflects successful results of the Decade of ESD (2005-2014) and the role of education as a decisive factor of changes.

* Lomonosov Moscow State University, Faculty of Geography, Department of Environmental Management, e-mail allapa@yandex.ru, phone: 79 037 95 72 47.

The national education system of Russia was among the first to respond to the UN initiative to promote ESD. The first ESD projects in Russian were launched in the late 20th century. Following the UN sustainable development initiatives, the first Russian Department of Environmental Management (hereafter referred to as DEM) was established in 1987 at the Faculty of Geography of the Lomonosov Moscow State University (MSU). It is based on a synergy of a classical geographical science and ecological and SD agenda. This bi-component educational system is aimed to respond to the global changes we have been observing.

2. Drivers of the educational system of the Department

Achievements of the Russian Higher Education Institutions (hereafter referred to as HEIs) in defining the fundamentals of ESD, as well as their contribution to an educational process, are based on world known scientific and educational principles, which have much in common with SD. One of these principles is ecological/environmental component of geographical education introduced in 1977 following the World Conference on Environmental Education (Tbilisi, Georgia). These traditions formed the basis of the educational system implemented at the DEM.

Summing up, the educational system at the DEM includes the following components: traditions of ecological (environmental) education of the Russian Higher School and innovations and achievements of international science related to SD education [Mazurov & Pakina 2014: 64-75].

The introduction of ecological education and – later – education for sustainable development at the curriculum of the Faculty of Geography is a remarkable milestone for the Russian Higher School. Apart from many European countries Russian geography science employs the concept of "universal geography" which does not consider physical and human separately. According to V. Anuchin, geography explores fundamental laws of interaction between Nature and Society [Anuchin 1982: 12-36] and this thesis a backbone of Russian geography school.

Nature Management is the main object of research at the DEM. Historically, scholars defined Nature Management (hereafter referred to as NM) as an interdisciplinary study and complex practical activity consisting of two main parts: Nature Use and Nature Protection (Fig. 1).

With the new educational standards introduced in 2011, the department now offers Bachelor and Master programs in Ecology and Nature Management (4 and

2 years respectively). Additionally, the DEM has "Economic, social, political and recreational geography" and "Geo-ecology" programs for post-graduate students.

The DEM offers students theoretical and practical basics of NM with field studies to put theory into practice. Following the interdisciplinary approach, we have prepared and introduced versatile courses to cover different aspects and meet challenges of NM, as: develop a wide range of studies and researches in such fields as:

– remote sensing methods and GIS technologies,
– mapping,
– environmental monitoring,
– ecological economics,
– landscape planning and design and others.
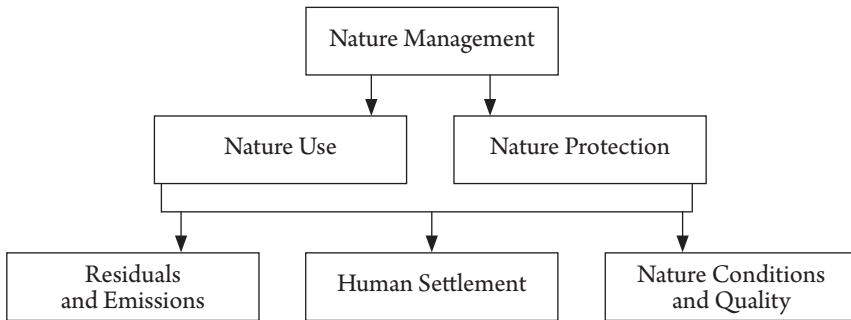
Figure 1. General structure of Nature Management

Source: Mazurov & Pakina 2014.

The obligatory courses Geo-ecological monitoring, Bases of Environmental Management, Environmental Economics, Environmental Impact Assessment, Industrial Ecology and Technogenic Risk, Sustainable Development, etc. and optional Environmental Management, Waste Management, Innovative Technologies and Resource Efficiency, etc. are directly related to SD.

The DEM's staff traditionally is engaged in both teaching and scientific activities, which enables to update courses and develop new ones. The DEM's research areas include assessment of ecosystem services, urban environment, natural protected areas etc. covering Russia and foreign countries. Noteworthy, many of them focuses on the Russian Arctic and the Baikal area.

For example, several important research projects on ecosystems conditions and natural heritage state of the Russian Arctic were conducted at the Taimyr peninsula – one of the biggest in the world. One of them is the joint Russian-Dutch expedition "Save ecosystems of the Russian Arctic" organized in 2002-

2008 in cooperation with the Alterra institute (Wageningen University and Research Center, the Netherlands), D.S. Likhachev Russian Research Institute for Cultural and Natural Heritage (Moscow, Russia) and the Great Arctic Reserve (Dudinka, Russia). Some of the expedition's goals were:

– assessment of natural conditions of local species habitats,

– natural landscape fluctuations caused by climate changes,

– prospects of ecotourism as one of the most efficient forms of sustainable use of the pristine nature of the area [Henkens, Mazurov, Pakin, Pakina & Pedroli 2005: 55-97].

Prospects of green development were explored in the Republic of Buryatia, a region located in the Baikal area. The area is rich in mineral resources, has a huge territory, harsh climatic conditions and is underpopulated. The core of the area – Lake Baikal – is globally known for its ecological value, pristine wilderness and a great supply of fresh water with unique hydro-chemical characteristics. Due to these features, the lake with its surrounding territories has a status of the World Heritage Site. Projected economic development of the territory threatens its environment. Current situation and prospects of green economic development we examined during the expeditions between 2011 and 2014 (Photo 1).

Photo 1. Field training of the Department's students at the Republic of Buryatia (Baikal area), February 2011 (http://rpp-msu.ru).

The next DEM's research area is an urban environment. The implemented research methods and equipment include measurement of physical contamination, remote sensing, and GIS technologies. The research also relies on traditional methods as mapping of the Earth's surface with its natural, economic, cultural and social features. The most significant results of urban environment research are being integrated into DEM's and the faculty's educational programs. DEM's students are allowed to participate in the research process and to use the data obtained in their own projects.

The most important component of 'traditional' education at the Faculty of Geography of MSU is a summer field training. This is an obligatory part of the educational process as well as lectures and seminars. Summer field trainings ("practices") take place at the Faculty's facilities 150 km from Moscow where 1st year students spent 9 weeks studying biogeography, geomorphology, meteorology etc. 2nd year students put theory into practice in different regions of Russia and abroad.

However, sustainable development framework is not adopted by all the 15 departments of the Faculty at the same level. The Cryolithology and Glaciology Department has courses on field and laboratory methods of studying frozen soils, ice and snow, modelling of permafrost-glacial processes and indicators of permafrost, glaciers, avalanches and debris flows and their mutations caused by economic activity in Arctic and mountain areas. Students of the Department of Economic and Social Geography of Russia study differentiation of social and economic processes at the regional level (geography of investments, migration processes, urban studies, political geography, etc.).

In contrast, the DEM focuses on environmental impact of economic activity and land use. In this regard, we conduct research at the field stations in several regions, differing in natural conditions and type of human impact on natural landscape: Krasnovidovo station in the Moscow region, stations in the Crimea Republic and Kola Peninsula. The main objectives of this 3-stage field practice are:

1) to examine the quality of the water at the Mozhaiskoe reservoir and test corresponding field methods (Krasnovidovo station; supervisor ass. prof. D. Badyukov);

2) to study the land use and technogenic pressure on the Crimea peninsula, socio-ecological aspects of urbanization with the assessment of its recreational potential (Crimea peninsula; supervisor ass. prof. T. Vorobieva);

3) to study the industrial impact on a fragile environment of the Arctic and monitor changes in various components of ecosystems caused by mining (in particular, apatite-nepheline and copper-nickel ores) (Kola Peninsula; supervisor prof. A. Evseev).

The 3rd year students have individual practice plans reflecting their own scientific interests. Each year field practice is obligatory and "costs" 12 credits.

Thus, the establishment of the Department was initially aimed at introduction of environmental problems into the educational program. Today, these issues are regularly updated to meet modern challenges. All the activities described above are considered to be traditional components of the educational process, updated according to the modern requirements. At the same time, we develop new approaches to eliminate drawbacks of the existing system.

3. New ideas in education for sustainable future

One of the pioneer documents on ESD agenda in Russia is the Project of the National Strategy of Education for Sustainable Education. It was introduced in 2006 by the group of researchers headed by the then dean of the Faculty academician N.S. Kasimov [2008: 12-23]. The Strategy highlighted the importance of moving towards interdisciplinarity across all educational programs (Fig. 2).
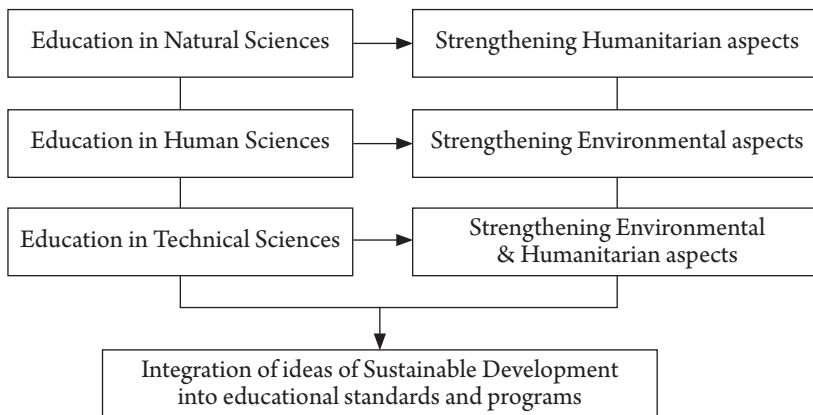
Figure 2. Principal changes in Russian HEI's educational programs

Source: own elaboration.

Further, the Plan of Actions for ESD was prepared by the specialists of the Faculty. The ultimate goal of the Plan is "to establish robust educational system serving sustainable development of Russia".

The main objectives of the Plan are outlined below:

– objective 1. To assist the popularization of sustainable development principles among Russians,

– objective 2. To re-think the role of education as a key element of a long-term strategy of the country's development,

– objective 3. To establish institutional framework for ESD in Russia,

– objective 4. To develop scientific and methodic framework for integration of sustainable development principles at all levels of general, professional and non-formal education in Russia,

– objective 5. To provide state support for material and technical basis of ESD,

– objective 6. To guarantee involvement of qualified teachers in ESD agenda.

The conditions we move towards sustainable development in are varying. Today we face new challenges differing from those of the 20th century. We live in the highly competitive world and modernization of national educational systems faces the following challenges:

– New Environment: physical and informational,

– New Society: significant disproportions in living standards across the world which are also applicable for environmental conditions,

– New Student: a high level of mobility and information consumption,

– New Geography: from description to forecasting.

Thus, the new SD principles should meet the following requirements:

1) to be quite flexible, perceiving and reflecting ever-changing trends of social, scientific and technological development;

2) to provide robust scientific fundamentals and interdisciplinary approach.

The Figure 3 presents the changes in curriculum and teaching process at the modern phase of ESD development.

FROM	TO
Curriculum as completed scheme Fixed and abstract knowledge Single educational model Passive teaching	Curriculum as an experiment Situational education Flexible real knowledge Invariant educational models Active teaching
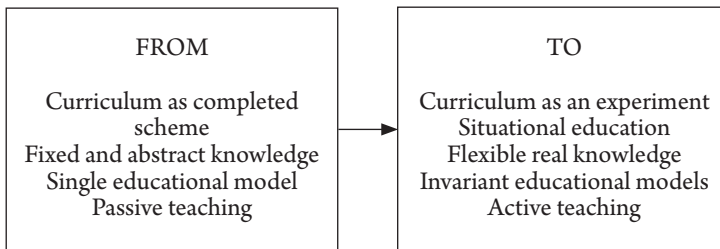
Figure 3. Changes in a curriculum and in a content of the teaching process during the transition to ESD implementation

Source: Kasimov et al. 2005: 38-49.

Adopting innovative methods and educational principles the Department has launched two programs of distance education, namely "Ecology and environmental management" and "Aesthetics and design of landscape." Description of these programs is available on the web-site of the Center of distance educa-

tion of the Moscow State University (http://de.msu.ru). Educational programs were designed to strengthen professional skills in the corresponding areas and are available for people from any region of Russia – from Kaliningrad to Vladivostok, as well as for people from neighboring countries (Belarus, Kazakhstan, etc.). Graduates obtain a certificate of completion.

Another important direction of modernization – development of international relations. The geography of scientific cooperation stretches from UK, Sweden, Germany, the Netherlands to Japan. Russian-Swedish project on ESD conducted between 2008 and 2013 is the case of successful international cooperation. The project was launched by the Russian Ministry of Nature Resources, which was interested in borrowing Swedish experience in Education for Sustainable Development. The Swedish Agency on Environmental Protection supported the initiative and the project was launched in September 2008. The list of participants included MSU, the Russian Academy of Public Administration under the President of the Russian Federation and three Swedish universities (Lund, Uppsala and Luleo).

The main objective of the project was to share experience in education for sustainable development, to set new goals and design new approaches to train Russian state officials for sustainable environmental management [Alekseeva,

Photo 2. Participants of the 1st Russian-Japanese Collaboration Seminar on Sustainable Environment, Moscow, MSU, 2013 (http://rpp-msu.ru/).

Kasimov, Mazurov, Osterlund, Pakina & Plepys 2011: 86-103]. Nine joint Russian-Swedish ESD seminars for state officials and policy makers of the Russian Federation were held during the 1st and 2nd phases of the project. The programs of the seminars were designed by professors from Sweden and Russia. The seminars were held in Moscow, Vladimir, Voronezh, Syktyvkar and Ukhta (Russia). The seminars were highly appreciated by participants.

Sharing of ESD experience and adaptation of global best practices in the educational process are among the main goals of the DEM. A number of seminars on Sustainable Environment with support from colleagues from the Tokyo university are scheduled (Photo 2). The 2nd seminar was held on 23-25 of March 2015 in Tokyo. It's another significant milestone in DEM's activity.

A response to actual challenges is a key goal of the educational process at the Department of Environmental Management. Taking into account the new 17 Goals of Sustainable Development, described in Agenda 2030, the educational system is changing moving towards complex, multi- and interdisciplinary approach reflecting diversity and complexity of the contemporary world.

References

Aichi-Nagoya Declaration on Education for Sustainable Development, 2014, www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ERI/pdf/Aichi-NagoyaDeclaration_EN.pdf [24.11.2015].

Alekseeva N., Kasimov N., Mazurov Yu., Osterlund S.E., Pakina A., Plepys A., 2011. Sustainable development in the context of education: Swedish realities and Russian potential, *Geography, Environment, Sustainability*, vol. 1 (v.04): 86-103.

Anuchin V.A., 1982, Geographichesky factor v razvitii obschestva (Geographical factor in society development), *Mysl*, nr 20: 12-36.

Henkens R., Mazurov Yu., Pakin D., PakinaA., Pedroli B., 2005, *Sustainable tourism development: a feasibility study, Pristine wilderness of the Taimyr peninsula. 2004 report*, Moscow: Heritage Institute.

Kasimov N.S., Glazovsky N.F., Mazurov Yu.L., Tikunov V.S., 2005, Geographia i obrazovanie dlia ustoichivogo razvitia (Geography and education for sustainable development), *Vestnik Moscowskogo universiteta*, Seria 5: Geographia, nr 1: 38-49.

Kasimov N.S. (ed.), 2008, *Obrazovanie dlia ustoichivogo razvitia v Rossiiskoi vyshey shkole: nauchnye principy I strategia razvitia* [*Education for sustainable development at the Russian high school: scientific principles and development strategy*], Moscow: Faculty of Geography.

Mazurov Yu.L., Pakina A.A., 2014, Education for sustainable nature management: traditions and innovations, in: *Engineering for green development. Proceedings of the 1st Russian-Japanese Collaboration Seminar for Sustainable Environment*, Moscow: MSU Publishers.

Edukacja dla zrównoważonego rozwoju: doświadczenia Katedry Zarządzania Środowiskiem Moskiewskiego Uniwersytetu Państwowego im. Łomonosowa

Streszczenie. Edukacja i oświata stały się obecnie kluczowymi czynnikami zrównoważonego rozwoju. Zasadnicza idea, która przyświecała Katedrze Zarządzania Środowiskiem, będącej jednostką Wydziału Geografii, wiąże się z faktem, że Ziemia jest jedynym znanym nam miejscem, na którym istnieje życie. W Katedrze Zarządzania Środowiskiem edukacja na rzecz zrównoważonego rozwoju opiera się na tradycji Wydziału i zawiera zarówno elementy geografii fizycznej, jak i społeczno-ekonomicznej. Program kształcenia podąża za szybkim tempem zmian zachodzących we współczesnym świecie – staje się coraz bardziej złożony i technicznie zaawansowany. Artykuł przybliża zarówno tradycyjne, jak i innowacyjne aspekty kształcenia na rzecz zrównoważonego rozwoju realizowanego w Katedrze Zarządzania Środowiskiem.

Słowa kluczowe: szkoła wyższa, edukacja, zrównoważony rozwój, zarządzanie środowiskiem, nauczanie interdyscyplinarne

Irina Puhachova*

Education for Sustainable Development: Experiences of the Student Research Team "Ecologist" at the Belarusian State Agricultural Academy

Abstract. The student scientific team "Ecologist" was established in 2006 at the Belarusian state Agricultural Academy in an effort to bring together students from different disciplines who are interested in solving environmental problems. Research projects are the primary mode for accommodating student interest in environmental learning. Another way of linking the classroom with practical experience is through opportunities for students to participate in campus-wide and outreach environmental activities.

Keywords: sustainable development, research team, students, environmental learning, campus, ecological principles

1. Introduction

The faculty of Agricultural ecology was introduced in the BSAA in 1994. The academy is the only higher education institution in Belarus which trains specialists in ecology for the agri industrial complex. It is both a research and teaching faculty. Considering the importance of non-formal environmental education and knowledge students were given the opportunities to participate in campus-wide environmental activities, to evaluate and discuss agricultural production issues from environmental, economic, and societal perspectives.

To live up to UNESCO's definition of a sustainable development education that empowers youth with the knowledge, attitudes, motivations, commitments, and skills to solve and prevent the world's environmental problems, the academy

* Agricultural Biotechnology and Ecology Department of the Belarusian State Agricultural Academy, Gorki, Mogilev region, Belarus, e-mail: puhachova.irina@gmail.com, phone: +375 29 1155610.

provides unique learning environment in which students gain the knowledge, tools and practical experience necessary to achieve the appropriate balance between human needs and sustaining the health of our environment. The culture and values of our university campus date back to 1840 when it was set up in a picturesque place far away from the noise and dirt of big cities. In the process, the campus innovated and applied new practices and technologies that prevent pollution and waste, serving as a model of a green campus for other institutions.

2. Genesis of students' research team

Student scientific team "Ecologist" was established in December, 2006 at the Department of Agricultural Biotechnology and Ecology of the Belarusian state agricultural academy who are continuing the work started in 2006 and are adding new projects and events. It was a bottom-up approach, so students are highly motivated, enjoy being productive and creative participating in activities connected with the ecological issues [Deci & Ryan 2000; Wentzel 2009]. Specific goal was to bring together students from different disciplines who are interested in solving environmental problems. In bringing together students from various disciplines, the aim was to foster a network for communication which could help increase the effectiveness of ecological efforts [James 2014].

Moreover, not only students of agriculture but a wider community should know more about agriculture's role in ecology as farming systems become more complex. This context is found in the "triple bottom line" of economics, environment, and society [Slaper & Hall 2011]. It is necessary to emphasize greater understanding of this triple bottom line in agricultural production in an ecosystem context with the focus on the global trends of increasing population and land-use pressure; diminishing soil, water, nutrient, and energy resources; concern over the negative impacts of agricultural production on the environment; and increasing awareness of the potential ecosystem service benefits from agriculture.

To achieve this the department tries to combine research projects and campus-wide environmental activities and initiatives which promote environmental sustainability and are supported by students, staff and outside organisations.

3. Scope of activity of students' research team

The group hosts regular information panels, speaker series, meet-and-greets with environmental professionals and on-campus conferences, as well as volunteer

events. The students actively work to promote and sustain positive restoration practices on campus and within the greater university community. Many activities are connected with work to reduce the local environmental impacts.

The group met with the head of the Regional inspection of natural resources and environmental protection, discussed the reasons of ecological degradation of water bodies near our town. The main sources of pollution are vegetable garden areas where fertilizers are used extensively, garages, the equestrian school, cattle-breeding farms located near the lakes. Students participated in ecological training which was provided by the organization named "Eco-house" and received a grant to continue their studies. The received grant was used to publish the information booklet on the ecological state of water bodies near Gorki.

The team members hosted some speaker series over the regional radio about their activities and the importance of water in nature and human life. The main activities of the student research team "Ecologist" were reflected in the academy's newspaper articles. The team introduced a variety of sustainability initiatives for its operations. These included the presentation of the environmental fairy-tale in Gorki orphanage considering the impact of fairy tales on environmental education of children. It was about the naughty princess who did not know how to use things carefully. The students also organized a competition for these children "What to do with the waste?" In such a way children are encouraged to feel, understand and act for the environment.

Another kind of activity is "green schools" – communicating science to school pupils on "Ecological problems of the Republic of Belarus," "Global ecological problems," "Sustainable development, Local Agenda 21" and so on. School children participated in the discussion of the offered problems, asked questions and expressed their points of view. We used a new form of communication with children - a role- game (students spoke about the problems of the environment on behalf of the atmosphere, soil, river, forest, stork).

Members of the team participated in the regional activities of the Sustainable Development Week – 2010. The informational and educational seminar "National Strategy for Sustainable Development of the Republic of Belarus" was held at the Department of Agricultural Biotechnology and Ecology. Belarusian state agricultural academy was awarded with a diploma of the Foundation "Living Partnership" for hosting this event.

Students took part in the Belarus competition within the project "Prospects for socio-economic development of the affected by the Chernobyl disaster areas of the Republic of Belarus."

They produced leaflets on waste problem using the Internet (photos and the text in the form of a poem) which were distributed in students' hostels and among schoolchildren.

Members of the team "Ecologist" successfully participated in the International Student Olympiads "Environmental safety", which was held in the period from 2008 to 2011 in various universities of Belarus, Russia and Ukraine winning prizes every year.

The interaction between students and school pupils, students and pupils of orphanage allows to communicate more effectively in non-formal environmental education.

4. Groundwork for students' activity in Gorky

Ecological programs have as their goal not only to change individual behaviors but also to contribute to both social and ecological processes that foster social-ecological system well-being [Tidball & Krasny 2011]. Implementation of the sustainable development principles in education and training of ecologists in Belarusian state agricultural academy is due to the special atmosphere which is created in the academic town. A place that has a unique cultural and social identity is defined by the way it is used and the people who use it. The surrounding itself inspires students to think about the world they live in.

Academy campus landscapes are an excellent context in which to demonstrate ecological principles in practice. Conserving water by planting locally adapted, native plants; limiting applications of pesticides; providing food, water and shelter for songbirds and butterflies; and restoring degraded habitats are just a few of the methods the students on campus are using. They also provide areas for students to study ecological systems in action. The campus offers students a range of opportunities to apply environmental knowledge in the Botanical Garden, a dendropark, in the experimental fields, on campus.

There are many research initiatives at the farms and centers with an environmental focus. Researches concentrate on the priority areas of the intensive, environmental friendly and resource saving technologies:

– in plant growing – on the development of comprehensive ecological and economically grounded farming systems based on biotechnology, extended reproduction of soil fertility, energy saving technologies, new varieties, fuel alternatives, reduction and mitigating use of pesticides, fertilizers;

– in animal husbandry – on the improvement of resource saving ecologically safe technologies in animal and feed production and farm animals feeding;

– in farm engineering – on the development of technological machines and equipment for safe farm mechanization processes;

– in economics – on the improvement of scientific system of market relations, the formation of multi sector economy, effective performance and information collection in agri industrial complex.

The students are directly involved in the organization of sustainable, ecologically safe agricultural production at the industrial fishery, a model dairy farm, a car diagnostics station, a botanical garden, experimental stations and fields. These resources provide experiential learning opportunities for students, foster good public relations, and set an important precedent for other institutions to follow.

5. Conclusion

The global environmental crisis has put ecological problems to the forefront. The future of all mankind depends on its solution. Responsibility for solving these problems lies on the shoulders of young people. Student scientific team "Ecologist" was established at the Belarusian state agricultural academy in order to draw the attention of young people to environmental problems and to teach them how to deal with these problems. The academy provides unique opportunities for students to gain the crucial skills through what is taught and practiced, both within the classroom and through the management and operations of the campus.

References

Deci E.L., Ryan R.M., 2000, The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior, *Psychological Inquiry*, 11(4): 227-268.

James N.P., 2014, Golden Rules for Engaging Students in Learning Activities, www.edutopia.org/users/nicolas-pino-james [2.12.2015].

Slaper T.F., Hall T.J., 2011, The Triple Bottom Line: What Is It and How Does It Work?, *Spring*, 86(1): 4-8.

Tidball K.G., Krasny M.E., 2011, Toward an ecology of environmental education and learning, *Ecosphere*, 2(2): 1-17.

Wentzel K.R., 2009, Peers and academic functioning at school, in: K. Rubin, W. Bukowski, B. Laursen (eds.), *Handbook of peer interactions, relationships, and groups. Social, emotional, and personality development in context*, New York: Guilford Press.

Edukacja dla zrównoważonego rozwoju a doświadczenia studenckiego zespołu naukowego „Ekolog" na Białoruskiej Państwowej Akademii Rolniczej

Streszczenie. Studencki zespół naukowy „Ekolog" został utworzony na Białoruskiej Państwowej Akademii Rolniczej w 2006 r. w celu skupienia studentów różnych dyscyplin zainteresowanych rozwiązywaniem problemów ekologicznych. Projekty naukowo-badawcze są główną metodą zaspokajania zainteresowania studentów wiedzą o środowisku. Innym sposobem łączenia teorii akademickiej z doświadczeniem praktycznym jest możliwość uczestniczenia w studenckich inicjatywach ekologicznych o zasięgu ogólnouczelnianym, a nawet szerszym.

Słowa kluczowe: zrównoważony rozwój, zespół naukowy, studenci, wiedza o środowisku, uczelnia, zasady ekologii

Kristīne Bērziņa*, Ilze Medne**

Methods Used
in Undergraduate Study Programmes
for Tourism and Sustainability
at the University of Latvia

Abstract. Globalisation in education sector, intense competition between universities in Latvia, increase in requirements of applied teaching from private companies, growing exactingness from students – it all makes base to improve University curricula using different active teaching techniques for better knowledge capture. In the case study of University of Latvia tourism study programme authors included practice of active teaching method application used to improve student understanding and competences including research, surveys, observations, shadowing, monitoring and register of the tourist tracks, expert interviews and industry seminars, discussions and interviews with industry stakeholders, field trips, different tourism sector enterprise and organisation visits inspections, colloquiums, research result presentations in seminars and conferences, knowledge enhancing for sustainability, best practices and systems used by other countries. Many of active learning methods are as additional activities for students not included in the compulsory part of studies, therefore it is needed to establish an additional separate entity for tourism and sustainability activities for applied teaching and research at university – Tourism and Sustainability Research Laboratory. Separate research entity gives possibility to involve interested students from different study programmes and cooperation with other faculties.

Keywords: tourism, tourism education, sustainability, quantitative research methods, qualitative research methods

1. Introduction

Over the decades, tourism has experienced continued growth and deepening diversification to become one of the fastest growing economic sectors in the world. An ever-increasing number of destinations worldwide have opened up to, and in-

---

* University of Latvia, e-mail: kristine.berzina@lu.lv, phone: 371 670 347 18.
** University of Latvia, e-mail: ilze.medne@lu.lv, phone: 371 670 347 18.

vested in tourism, turning it into a key driver of socio-economic progress through the creation of jobs and enterprises, export revenues, and infrastructure development. One in 11 jobs worldwide is directly and indirectly generated by the tourism industry, one job in tourism generates 1.5 jobs elsewhere [UNWTO 2015].

Tourism involves a wide range of different activities, types of establishments, employment contracts and working arrangements. It provides working people with income and working experience and therefore contributes to their social inclusion and personal development. Tourism is a people's sector in all its aspects and dimensions [UNWTO & ILO 2014].

The tourism trends of the 21st century show that a new tourism demand needs changes in the working methods and new working methods need changes in the education and training programs.

2. Needs for new approaches to the tourism education: from passive to active learning

Recently created international tourism educator, community, non-governmental organization and industry actor network Tourism Education Futures Initiative (TEFI) indicates that during the last years, it has become increasingly obvious that tourism education needs serious rethinking. Surging growth in tourism arrivals and receipts, going strong since the middle of the twentieth century, spurred a proliferation of tourism programs in higher education to meet the demands of the burgeoning industry. As more complex understandings about tourism began to emerge, however, it became clear that equating the industrialization and growth of tourism with social and economic progress was far too simplistic – indeed, increases in visitation and receipts do not always reap positive benefits. Simultaneously, rapid socio-cultural and economic changes are afoot, which are rendering the future increasingly uncertain. The jobs of today are markedly different from those of yesterday, and it seems certain that those of tomorrow will be different still. Students entering the tourism sector, with its high levels of volatility and rapid globalization, are going to need different skills and understandings in order to achieve meaningful and successful professional lives.

During the twentieth century, tourism education was largely focused on developing business acumen and service skills, with little consideration being given to the ethical and moral foundations students would need to navigate the professional world and become socially and environmentally responsible leaders there.

This values-based approach to tourism education strives to broaden and deepen tourism education – to evolve beyond the narrow, instrumental, short-

term focus of days past, to incorporate humanist values, and impart the skills and knowledge necessary for making mindful decisions. TEFI engages students, industry, and communities in life-shaping learning experiences and reflection that contributes to the moral development of tourism practitioners.

TEFI's values are based on five overlapping dimensions:

– stewardship: exercising an ethic of care by upholding principles associated with sustainability, responsibility, and service to the community,

– knowledge: developing critical thinking, innovation, creativity, and networking, and appreciating different sources and types of knowledge about tourism,

– professionalism: aspiring to the highest standards of professional practice underpinned by leadership, practicality, services, relevance, timeliness, reflexivity, teamwork, and partnerships,

– ethics: engaging in good action and decision-making, underpinned by honesty, fairness, transparency, and authentic dialogue,

– mutual respect: embracing a humanistic approach to tourism, including a respect for diversity, inclusion, equity, humility, and collaboration [Dredge & Schott, Daniele, Caton, Edelheim & Munar 2015].

Educational experts Martin and Woodside asks, what are useful learning methods to for tourism and hospitality professionals to experience about new theories and practices in their fields. The answer is that a good cognitive-only teaching method for managers does not exist. The ineffectiveness of telling-pedagogical learning is not a new discovery. Cognitive learning just does not work for adults. Adults' life experiences are the foundation and motivation for ongoing learning. Tough (1982) conservatively estimates 80% of learning is accomplished through self-help, or among groups of peers. Since only 20% of adult learning is a cognitive process delivered pedagogically, a different education paradigm is needed [Martin & Woodside 2009].

Educational researchers [Knowles, Holton & Swanson 2013; Revans 2011; Cambourne 1993] have called for learning that transcends traditional passive forms and transitions to more active and authentic styles. Passive form of learning refers to a basic level of learning where information is reflexively transferred from teachers to learners, requires only nominal participation from learners, and emphasizes the conceptual understanding of facts and theories.

Sue S. Wingfield and Gregory S. Black [2005] characterise the passive form of learning with the following expressions: Lecture style; Minimal student input through discussion or experiential exercises; Emphasizes conceptual knowledge by focusing on facts and theory. Norbert Michel, John J. Cater and Otmar Varela [2009] characterise this form of learning as follows: Traditional lecture approach; Provides teachers a convenient and expeditious means of instruction; Introduction of basic principles to a large number of students.

Active learning differs from passive in that it requires students to participate in their own learning. One type of active learning is situated learning in which information and skills are taught in a setting that reflects their value in real life [Collins 1988]. Jan Herrington and Ron Oliver [2000] characterise the situated learning as follows: Greater levels of student involvement and participation in learning activities; Teach theories and concepts in a way that shows real-world application, Allan Collins [1988]: Learning theory in an environment that reflects how that theory is useful in a real-world situation.

The other form of active learning – authentic learning involves "learning that focuses on educational activities related to real-world problems and issues" and "also creates environments that involve learning in contexts that are as genuine as possible, providing learners with multiple perspectives, making students more responsible for their learning" [Deale 2007].

3. Up-to-date learning method use in tourism education processes in the University of Latvia

The modern methods present the following characteristics – they develop the pupils' and the students' personality representing the formative side of the education; they are focused on the students' learning activity; they are focused on action, on learning by discovering; are flexible, encourage the students to learn through by cooperation and have the capacity for self-evaluation, the evaluation is a formative one; they stimulate the intrinsic motivation; the relationship teacher-student is a democratic one based on respect and collaboration [Sirbu, Tonea, Iancu, Pet & Popa 2015].

Without naming all the possible teaching methods, it is possible to give the very pointed citation of Confucius for active teaching methods: "I hear and I forget. I see and I believe. I do and I understand". This do approach is what we try to use in study programmes. The list of modern teaching methods under the doing or participating section is long, sometimes comprising even 150 methods, including – discussions, problem solving, cooperative group work, project tasks, case studies, field trips, inspection tours, role plays, research applied, surveys, observations, shadowing, expert interviews, industry seminars, colloquiums, all that can be applied for knowledge enhancing for sustainability [Jacobsen, Dupuis & Kauchak 2009; Yakovleva & Yakovlev 2014].

The heterogeneous nature of tourism industry has influence on tourism education thus creating additional need for tourism education institutions to cooperate with different stakeholders and thus requiring application of wide range of ac-

tivities using different knowledge applied teaching methods. Tourism education institution cooperation with tourism industry public sector organisations give possibility for students to apply in lectures gained research and planning skills. At the same time cooperation with tourism industry private companies give possibility for the enhancement of the students' particular marketing and management practice understanding. Cooperation with other academic sector institutions simplifies the participation in common projects in order to attract local and international guest lecturers.

University of Latvia Tourism and hotel management undergraduate study programme has been going through the stages of development since 1994. Demands of the students who seek for competitive advantage in their work and demands of the industry force to apply different modern teaching methods or even look for possibility to reorganise the whole programme. In the case study of University of Latvia tourism study programme authors included practice of research
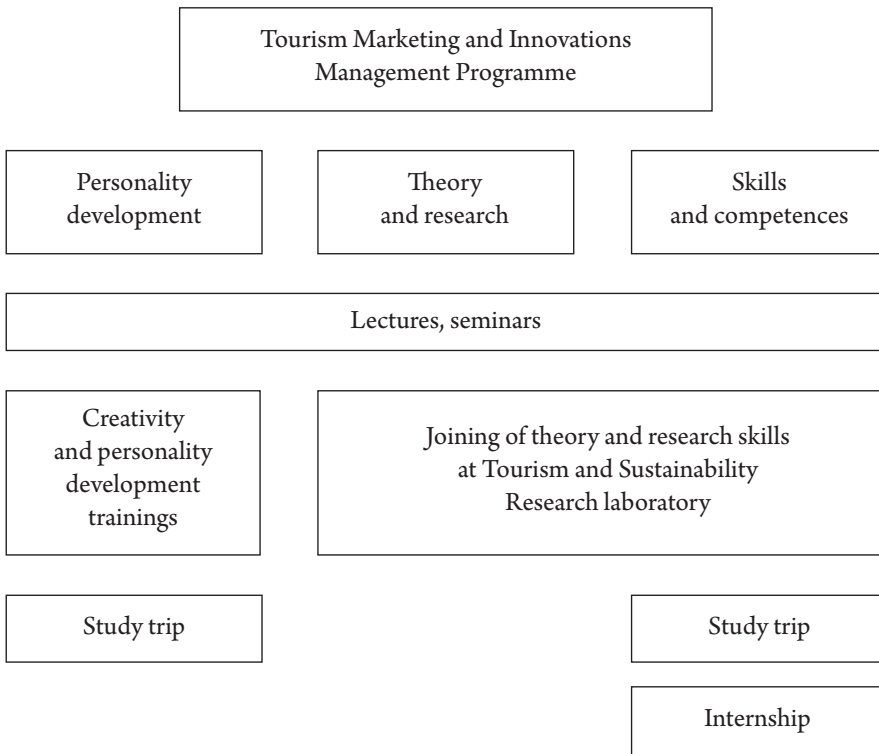

Figure 1. The Architecture of Tourism and innovations management programme at University of Latvia

Source: own elaboration.

methods application used to improve student understanding and competences. (Fig. 1).

University of Latvia in the tourism education offers the possibility to apply extensively different quantitative and qualitative research methods. Survey conduction is practice that is carried out in different study courses for all that mainly in marketing course. Students are involved in research plan development, questionnaire development, data collection, data input as well as data analyses. Surveys of local inhabitants to study their attitudes towards international tourists analysing local inhabitant attitudes as part of the destination management as well as destination sustainability aspect can be mentioned as the appropriate examples. This type of research activity can be carried out both for local students as well as for international exchange students.

Another example of utilisation of survey is questionnaires of international tourists conducted in Latvia or in priority target markets. By surveys abroad the students, in addition to quantitative research application skills, gain the cross-cultural interaction experience (Photo 1).

Photo 1. University of Latvia student field trip (Germany, Liechtenstein, 2015)

As example for qualitative research method application can be mentioned observations conducted by students, for instance cruise tourist shadowing, monitoring and register the tourist tracks from Riga port area to the downtown. Shadowing enables to observe international tourist behaviour, make notice of their time spent in the city, analyse the most visited places, look for the goods and services used during these few hours out of cruise ship; and gather data on shadowed tourism spending (Photo 2).

Based on the shadowing research in the cruise report, students and teachers developed suggestions for better infrastructure and information sign usage.

Scientific base for qualitative and quantities research method combination can give additional understanding, still observations and shadowing are underestimated methods [Perlow 1998; 1999; Bonazzi 1998; McDonald 2005]. Observation and shadowing combination with in-depth interviews and surveys give
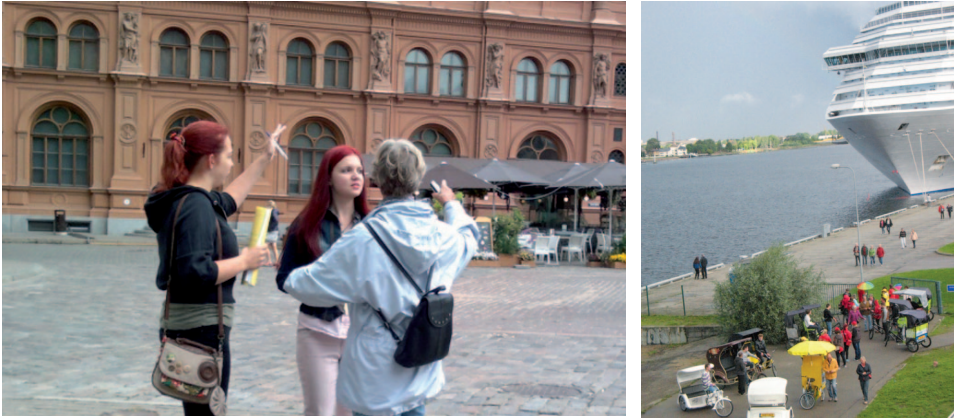
Photo 2. University of Latvia student shadowing and interviewing of cruise passengers (Riga, 2014)

a wider perspective in problem analysis [Polite, McClure & Rollie 1997; Bonazzi 1998; Perlow 1998; 1999].

Additionally to the University lecturers, students have possibility to hear lecturers from other international tourism education institutions and industry seminars. Good practice for high quality expert attraction is applications for financial support from several tourism education institutions of Latvia and this way competition is transformed into cooperation. Students from different Universities have possibility for cooperative learning during these guest lectures and seminars.

The industry process understanding is boosted by expert interviews and industry seminars, discussions. Different tourism sector enterprise and organisation visits inspections, colloquiums, research result presentations in seminars and conferences, knowledge enhancing for sustainability, best practices and systems used by other countries are used in tourism subjects.

Mentioned practices enhance skills trained: research planning, research management, data collection and analysis, presentation, team building, cooperation, communication with different people, cultural interaction, orientation in unknown environment, international event organisation.

All the wide range of applied active teaching methods creates need for separate frame – institution to have it as umbrella for all the activities conducted at the same time being a new online platform for further research development. In case of the University of Latvia this umbrella institution was the Tourism and Sustainability Research Laboratory for student and teacher cooperative learning-applied teaching approach. Separate research entity gives possibility to involve interested students from different study programmes and other faculties.

4. Tourism and sustainability research laboratory

The Tourism and Sustainability Research Laboratory (Fig. 2) was established in 2014 at the Scientific Institute of Economics and Management by the Faculty of Economics and Management.

The vision of the Laboratory: an important tourism and sustainability research centre in Latvia and the Baltic Sea region with international involvement and visibility.

Figure 2. Tourism and Sustainability Research Laboratory Logo

Source: own elaboration.

The mission of the Laboratory:

– do scientifically valid and economically significant research in the field of tourism and sustainability,

– improve the research skills of students of the Faculty of Economics and Management, enable the students to improve their knowledge in the field of tourism and sustainability,

– create an interdisciplinary research platform for the academic staff,

– provide Latvian and Baltic based tourism organisations and organisations of other economic fields and enterprises with scientifically valid research that provides innovative solutions for current issues,

– provide contribution for the international scientific environment.

The objectives of the Laboratory:

– do scientific and applied research for solving tourism and sustainability related problems,

– collaborate with interested parties in doing research in the field of tourism and sustainability,

– involve students and academic staff in the research process using an interdisciplinary and systematically approach,

– organise events (lectures, seminars, conferences) for improving the knowl-edge and research skills of students and tourism professionals,

– organise events for improving the knowledge and research skills of stu-dents and the workers of the economic sector in the field of sustainability,

– monitor the current events in the field of tourism and other economic sec-tors and international research. Present the results to the interested parties,

– participate in informing the society and other interested parties about the current research events and results,

– actively share research results in the international scientific environment (participation in conferences, scientific publications).

More than 70 students of the Faculty of Economics and Management have already been involved in several research projects: "Consumer Behaviour of For-eign Tourists in Riga – 2014," "Cruise Tourism Study in Riga" and "Latvia as Tourism Destination Brand Awareness and Equity in Germany as High Priority Target Market." Students were involved in conducting respondent's interviews, shadowing and data pre-treatment.

5. Conclusion

A wide range of active teaching methods and research skill enchasing tools are used for the study programmes of the University of Latvia, still many of these activities are additional activities for the students. Therefore it is necessary to es-tablish an additional structure for tourism and sustainability research at univer-sity. The Tourism and Sustainability Research Laboratory was established at the Scientific Institute of Economics and Management by the Faculty of Economics and Management of University of Latvia. The vision of the Laboratory: an im-portant tourism and sustainability research centre in Latvia and the Baltic region with international involvement and visibility that will allow go further in applied teaching method putting in practice.

References

Bonazzi G., 1998, Between Shock Absorption and Continuous Improvement: Supervi-sors and Technicians in a Fiat "Integrated Factory," *Work Employment and Society*, 12(2): 219-243.

Cambourne B., 1993, *The whole story: Natural learning and the acquisition of literacy in the classroom*, Jefferson City, MO: Scholastic.

Collins A., 1988, *Cognitive apprenticeship and instructional technology (Technical Report No. 6899)*, Cambridge, MA: BBN Laboratories Inc.

Deale C.S., 2007, An example of collaboration on an authentic learning project in heritage tourism: The case of the Scots-Irish in North Carlolina, *Journal of Teaching in Travel & Tourism*, vol. 7(4): 55-69.

Dredge D., Schott Ch., Daniele R., Caton K., Edelheim J., Munar A.M., 2015, The tourism education futures initiative, *Anatolia – An International Journal of Tourism and Hospitality Research*, vol. 26(2): 340-346.

Herrington J., Oliver R., 2000, An instructional design framework for authentic learning environments, *Educational Technology Research and Development*, vol. 48(3): 23-48.

Jacobsen D.A., Dupuis V.L., Kauchak D., 2009, *Methods for Teaching: Promoting Student Learning in K-12 Classrooms, 8/E*, London: Pearson.

Knowles M.S., Holton E.F., Swanson R.A., 2012, *The adult learner: The definitive classic in adult education and human resource development*, New York, NY: Elsevier.

Martin D., Woodside A.G., 2009, Moving beyond pedagogy to andragogy: Experimental learning exercises for tourism/hospitality executive training, *International Journal of Culture, Tourism and Hospitality Research*, vol. 3(4): 283-286.

McDonald S., 2005, Studying actions in context: A qualitative shadowing method for organizational research, *Qualitative Research*, 5(4): 455-473.

Michel N., Cater J.J., Varela O., 2009, Active versus passive teaching styles: An empirical study of student learning outcomes, *Human Resource Development Quarterly*, vol. 20(4): 397-418.

Perlow L.A., 1998, Boundary Control: The Social Ordering of Work and Family Time in a High-tech Corporation, *Administrative Science Quarterly*, 43(2): 328-357.

Perlow L.A., 1999, The Time Famine: Toward a Sociology of Work Time, *Administrative Science Quarterly*, 44(1): 57-81.

Polite V.C., McClure R., Rollie D.L., 1997, The Emerging Reflective Urban Principal – The Role of Shadowing Encounters, *Urban Education,* 31(5): 466-489.

Revans R., 2011, *ABC of action learning*, Burlington, VT: Gower Publishing Co.

Sirbu C.C., Tonea E., Iancu T., Pet E., Popa N.D., 2015, Aspects Concerning the Usage of Modern Methods for Teaching – Learning – Evaluation in Universities Original, Research Article, *Procedia – Social and Behavioral Sciences*, vol. 182: 550-554.

UNWTO, 2015, *Tourism Highlights. 2015 Edition*, Madrid.

Wingfield S.S., Black G.S., 2005, Active versus passive course designs: The impact on student outcomes, *Journal of Education for Business*, vol. 81(2): 119-123.

UNWTO & ILO, 2014, *Measuring Employment in the Tourism Industries – Guide with Best Practices*, Madrid.

Yakovleva N.O., Yakovlev E.V., 2014, Interactive teaching methods in contemporary higher education, *Pacific Science Review*, vol. 16(2): 75-80.

Metody wykorzystywane w nauczaniu na studiach pierwszego stopnia na kierunku turystyka i trwały rozwój na Uniwersytecie Łotewskim

Streszczenie. Globalizacja w sektorze oświaty, intensywna konkurencja pomiędzy łotewskimi uczelniami wyższymi, wzrost oczekiwań co do praktyczności kształcenia ze strony prywatnych przedsiębiorstw oraz wymagania samych studentów – to podstawy doskonalenia programów studiów wyższych i szerszego wykorzystania aktywnych technik przekazywania wiedzy. W przypadku studiów na kierunku turystyka oferowanych przez Uniwersytet Łotewski autorzy programu zastosowali praktyczne, aktywizujące metody nauczania służące wzbogaceniu wiedzy i kompetencji studentów, takie jak: badania naukowe, ankiety, obserwacja, work shadowing, monitorowanie i ewidencja szlaków turystycznych, wywiady eksperckie, seminaria branżowe, dyskusje i wywiady z przedstawicielami branży, wycieczki w teren, wizyty studyjne w firmach i organizacjach sektora turystycznego, kolokwia, prezentacja wyników badań na seminariach i konferencjach, poszerzanie wiedzy na temat trwałego wzrostu oraz poznawanie dobrych praktyk i rozwiązań stosowanych w innych krajach. Wymienione działania wzmacniają szkolone umiejętności: planowanie badań, zarządzanie badaniami, zbieranie i analiza danych, prezentacja, budowanie zespołu, współpraca, komunikacja interpersonalna, interakcja kulturowa, orientacja w obcym otoczeniu czy organizacja międzynarodowych imprez. Wiele spośród aktywnych metod nauczania stanowi komponenty opcjonalne i nie należy do obowiązkowej części programu studiów, toteż do obsługi takich form kształcenia i uprawiania nauki w ramach studiów na kierunku turystyka i trwały rozwój konieczne było ustanowienie Laboratorium Naukowego Turystyki i Trwałego Rozwoju. Taka odrębna jednostka umożliwia zaangażowanie zainteresowanych studentów różnych kierunków i sprawną współpracę międzywydziałową.

Słowa kluczowe: turystyka, edukacja turystyczna, trwały rozwój, ilościowe metody badawcze, jakościowe metody badawcze

Nadiya Kostyuchenko*, Denys Smolennikov**

Active Teaching Methods in Education for Sustainability as Applied in Good Practices of Local Communities

Abstract. This paper is dedicated to active teaching and learning methods in education for sustainability. Active teaching methods such as case studies, simulation games, debates, and role-playing are described in a step-by-step direction. Examples of the good practices of local communities in education for sustainability are provided in the paper.

Keywords: education for sustainability, active teaching methods, student engagement, case study, simulation game, debate, role-playing, brainstorming, local communities

1. Introduction

Nowadays more and more active teaching methods are applied into higher education worldwide. While lecturing tends to be the easiest form of instruction, studies (Dale, 1969) show that students absorb the least amount of information that way (without practical application, students often fail to comprehend the depths of the study material). At the same time, using active methods turn the teaching process to an interesting and attractive activity for students. Whereas students often lose interest during lecturing, interactive teaching styles promote an atmosphere of attention and participation. Active teaching techniques involve facilitators and learners, encourage and expect learners to participate. Group work stimulates individual input. Thus, active teaching methods lead to higher

* Sumy State University, Ukraine, Faculty of Economics and Management, e-mail: kostyuchenko.nadiya@gmail.com, phone: +380 502 573 755.

** Sumy State University, Ukraine, Faculty of Economics and Management, e-mail: smolennikov@gmail.com, phone: +380 501 419 413.

level of understanding and result in students' ability to apply the knowledge in their everyday life, nevertheless, such teaching techniques are often perceived by students as "fun".

At the same time simply introducing activity into the classroom fails to capture an important component of active learning. Active learning means that the mind is actively engaged. Its defining characteristics are that students are dynamic participants in their learning and that they are reflecting on and monitoring both the processes and the results of their learning [Barkley 2010: 17].

Thus, active teaching methods are promoting students' engagement (Becker, 2015), as the best way to study is to play the situation, which is close to a real one. According to the Dale's "Cone of Learning", students get up to 90% of knowledge when they stimulate or model a real-life experience [Dale 1969].

2. A conceptual framework
for understanding active teaching methods

There are different types of active teaching methods. Let's discuss the most popular of them:

1) The first one is **case study**.

Case study is the analyses of a real life situation, it relates the theory to a practical situation. According to Thomas (2011), "case studies are analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one or more methods" [Thomas 2011: 513]. Case study is created to analyze a real life problem that exists and to suggest solutions to these problem.

There are two different approaches to case studies:

– The Analytical Approach. This type of case study is examined in order to try and understand what has happened and why. It is not necessary to identify problems or suggest solutions;

– The Problem-Oriented Method. This type of case study is analyzed to identify the major problems that exist and to suggest solutions to these problems [How 2007].

To run the case study the major actors are to be identified for every situation. Students are to be divided into groups. Every group of students suggests its own solution to the major problems after brainstorming. As a result, they need to recommend the best solution and detail how this solution should be implemented.

2) **Simulation game** is an active teaching method.

"Simulations" are a model (or simplification) of reality or some natural systems" [Loon, Evans & Kerridge 2015: 228]. Simulation is a role-playing, which

involve people adopting roles in a mock-up of a situation [Akinsola & Anima-sahun 2007]. Simulation games allow for active learning as learners have to "do something" to acquire knowledge [Shaffer, Squire, Halverson & Gee 2005]. Decision-making in simulation games provide students with hands-on experience and opportunities to make decisions in a safe environment, and thus allowing students to experiment and learn from experience [Zantow, Knowlton & Sharp 2005].

3) Another active teaching method is **debate**.

Debate is a formal method of presenting arguments that support and oppose a given issue (Public, 2011: 5). "Debates provide a framework to help students develop more mature ways of thinking as they start to recognize the range of perspectives inherent in complex topics and internalize a view of knowledge that is dialogic, contingent, and ambiguous" (Barkley, 2010: 202).

For debate students are divided into groups and do role-playing (they act according to their roles in terms of strict time limit).

There are two main types of debates: Oxford Union style debate and Karl Popper style debate (Fig. 1 and Fig. 2). There are strict rules for both types of debates with a concrete role of each player. There can be 2 participants in each team in case of Oxford Union style debate, and 3 or 4 students in each team in case of Karl Popper style debate.
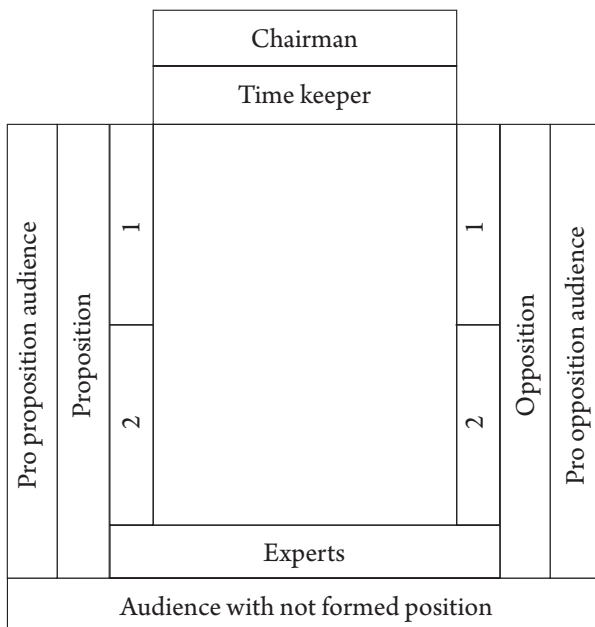

Figure 1. Oxford Union style debate

Source: own elaboration.
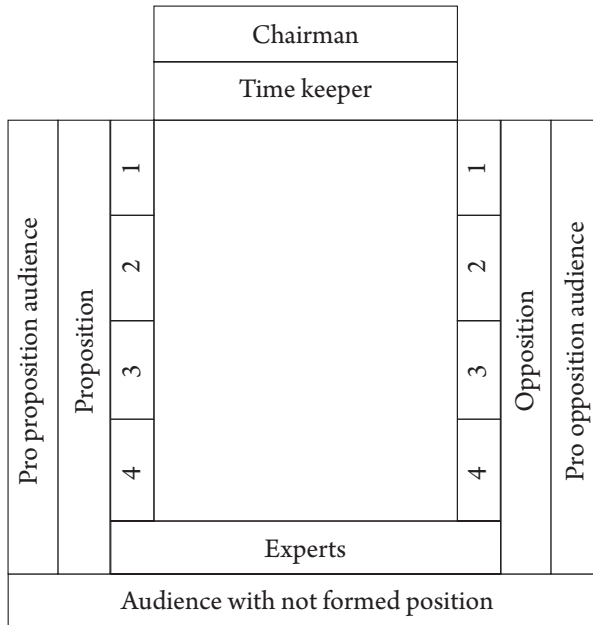
Figure 2. Karl Popper style debate

Source: own elaboration.

In both styles of debates there are two competitive parties: proposition (the affirmative team) and opposition (the negative team), and they have equal time to present their arguments. The proposition team gives its arguments to prove the statement, while the opposition party deny the statement giving the arguments against it.

The debate is composed of several parts. Most of them are speeches – that is, uninterrupted presentations by a designated speaker. The remaining ones consist of cross-examination – that is, a series of questions and answers involving one speaker from each side. There is a strict time limit for each speech and questioning as well as a specific purpose for every presentation.

– The proposition speaker is expected to offer the complete argument in favor of the resolution. Later the affirmative speakers may repeat some points and expand on them.

– The two debaters are expected to face the audience (as opposed to each other). The negative (opposition) debater is expected to ask questions rather than make speeches. The affirmative (proposition) debater is expected to answer these questions; he or she should not make speeches or ask questions in return. Every speech session ends with questioning.

– Like the affirmative team in its constructive, the opposition speaker is expected to offer a complete argument against the affirmative's position.

– The proposition rebuttal (or rebuttals) must outline refutations of the negative arguments and must respond to the refutations made by the negative team (that is, the negative's objections to the affirmative case). His/her speech is reactive. In case the last proposition rebuttal talks, he/she should renew refutations that have not been addressed adequately and focus the attention of judges on the key issues in the round.

– The opposition rebuttal (or rebuttals) also must respond to the refutations made by the proposition rebuttal, and should continue to attack the affirmative case. But if he/she is the last speaker, he/she has no right to introduce new arguments as the affirmative team has no chance to respond. In that case he/she is to summarized everything mentioned by the team before [Karl 2004; Oxford 2015].

There can also be audience and there is an opportunity for the audience to join the debate. Based on the arguments the audience makes decision on its position during the debate: do students from the audience support proposition or opposition team.

When speakers finish their speeches, the judging team vote according to the quality of the evidence and arguments and the performance in the debate; and the winner is found as a result.

4) **Role-playing**.

"Role play is a creative, participatory activity that provides the structure for students to experience the emotional and intellectual responses of an assumed identity or imagined circumstance. The word role indicates that students actively apply knowledge, skills, and understanding to successfully speak and act from an assigned perspective. The term play indicates that students use their imaginations and have fun, acting out their parts in a nonthreatening environment" [Barkley 2010: 232].

"Each role-play defines a setting of characters (or roles) through which a story will be developed. What happens when the students take on their roles is uncertain. One solution might be to script the role-play in a more formal and ordered way. It is possible, for example, to specify who speaks when, and identify the ideas, arguments and information that will be conveyed in each speech" (Sutcliffe, 2002). At the same time, role-playing means students act as they imagine appropriate to a given role [Rilstone 1994]. Within such a framework the teacher maintains strong control over the focus of the role-play.

5) **Brainstorming**.

Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members [Osborn 1963].

Brainstorming is a technique in which every student's response that applies to a given topic is acceptable. Brainstorming combines a relaxed, informal approach to problem solving with lateral thinking. It encourages people to come up with thought and ideas that can, at first, seem a bit crazy. Some of these ideas can be crafted into original and creative solutions of a problem, while others can spark even more ideas. Therefore, during brainstorming sessions it is important not to evaluate ideas, people should avoid criticizing. Students need to know that they will not be required to justify or explain any answer. After a period of brainstorming (which should not be too long), time for reflection on or prioritizing of the list should be allowed. The teacher helps students to summarize main points as well as to correct any misconceptions. Brainstorming can be done individually, in pairs or small groups, or as a whole class as well as combination of these.

Brainstorming is effective for several purposes: sensitive and controversial issues that need to be explored; encouraging students who are quite and hesitant to enter into discussions; generating a large number of ideas as quickly as possible [Participatory 2004: 6-7]. It promotes critical and creative thinking and imagination.

There are several methods for brainstorming:

– Brainstorming on the board – Students call out concepts and terms related to a topic; the teacher writes them on the board and, if possible, group them into categories. This type of brainstorming works to gauge pre-existing knowledge and focus attention on the subject.

– Brainstorming tree – While brainstorming on the board, circle the major concepts and perform sub-brainstorms on those specific words; the result will look like a tree blooming outward.
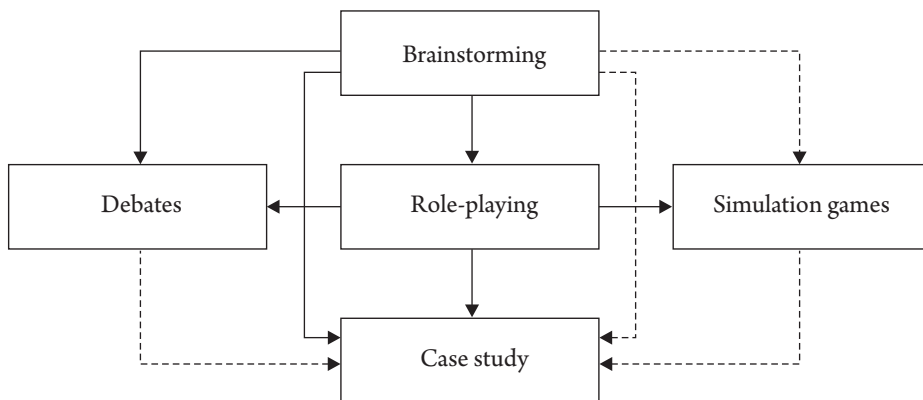

Figure 3. Types of active teaching methods

Source: own elaboration.

– Brainstorming in a circle – Group students to discuss an issue together, and then spend a few minutes looking at individual notes. One person starts a brainstorming list and passes it to the student to the right, who then adds to the list and passes it along again.

– Chalk talk – Ask students to go to multiple boards around the room to brainstorm answers to an assignment, but disallow them talking. This activity can also be done in groups [Resources: 13-14].

Some elements of one active teaching method can be a part of another active teaching method, i.e. brainstorming can be a part of debates, role-playing and case study; while role-playing can be a part of case study, debates or simulation game. Case study can be played in the form of debates. A simulated learning environment can support case based learning (Fig. 3).

3. Examples of good practices of local communities' experience in education for sustainability

There is a well-known phrase dealing with environmental issues: "Think globally. Act locally". These familiar exhortations have circulated within the slogan system of environmental education for more than four decades [Gough 2002].

One can use local experience to explain sustainable development issues to students. That is easier to understand what is happening in a nearby village than in another country or in the whole world. In case of sustainable development, that is easier to show some local practices to explain global problems to students.

Let's have a look at some good practices of local communities' experience that can be applied for explaining sustainable development principles.

3.1. Case study example

Description of the situation

Urban green spaces contribute greatly to the quality of life in cities. Green areas not only make the cities look more beautifully but they also provide a wide range of environmental, social, cultural and economic benefits to the society, starting with the assuring opportunities for recreation up to reducing the health risks.

Nevertheless, the role of urban greening increases highly, green areas started to disappear in many parts of Ukrainian cities over the recent several years. Zones of greenery in cities of Ukraine are rapidly built up with houses and supermar-

kets. Zones of greenery are green areas inside a city having a special status according to the official city plan. This is a territory, which has to be covered with trees, bushes and other greenery according to the city plan.

The city of Sumy is a typical regional center in Ukraine with population of nearly 300 000 people allocated on the East-North of the country. In the middle of 90th Sumy was a green city with lots of trees and millions of roses. Today there are much more less trees on the streets and almost no roses. Many city green areas have disappeared.

Nowadays the problem of air pollution is the urgent one in the city as Sumy is a city of chemical industry. There are four main factories-pollutants of air in the city. Air pollution influences negatively upon the health of people living in the city. The role of urban green areas in regulating the quality of city air is crucial. System of greening determines the quality of urban environment. Green areas contribute to the improvement of microclimate and sanitary conditions. They decrease air pollution from chemicals, slow wind speed, act as a trap for dust, reduce the power of sound waves, create a natural landscape in the city, etc.

But despite high air pollution in the city, the quantity of new urban greenery decreased over the recent several years in Sumy region (Table 1).

Table 1. Urban greening

Activities	2007	2008	2009	2010	2011
Quantity of new greenery, ha	4,8	7,4	7,5	2,4	2,8
Landscape reconstruction on vegetation, ha	4,3	4,5	4,4	3,8	1,6
Caring for plants, ha	1853	1858	1859	1911	2110

Source: *Dopovid pro stan...* 2012.

Problem statement

There is an attempt to destruct a zone of greenery in one of the city regions (where the urban green space per person is much less than the norm), and to construct a supermarket on that place.

The problem that happened in Sumy is not a unique one. A similar situation occurs in many other cities in Ukraine [Kostyuchenko & Petrushenko 2012: 217, 222-224].

Step-by-step directions

1.1. The teacher describes the situation and states the problem. If students need any additional information to make solution, the teacher also provides the stu-

dents with the information or explains were it can be found. The teacher also gives instructions at this stage.

Instructions:

1. The interests of different actors in the situation described differ a lot. Among the local authority deputies, there are fractions interested in personal gain from the situation when a zone of greenery is built up with a supermarket. Decision-making person, who is responsible for the control, is future owner of a supermarket that has to be constructed on that territory. These deputies also control several local radios and newspapers.

2. When a zone of greenery disappears, people living nearby the former zone of greenery are the first who face the problem. Many regions of the city are far distance from the city parks. For many people it takes a lot of time to get to the parks. That is why they visit the city parks rarely. They use green areas nearby there houses as recreation zones.

3. People that live nearby zones of greenery, which are under construction, are effected by the problem most of all. They used zones of greenery as places for rest. They also enjoyed a wonderful view from the windows of their flats. People living in the region of the city, where a zone of greenery (which is under construction) is allocated, also benefited from this area as they used it as a recreation zone. People living in other regions of the city (far from the zone of greenery) understand that the same situation can happen to their region.

1.2. Students are divided into groups according to the number of actors involved into the question.

The main actors of the situation are the next ones:
– people living nearby a zone of greenery, which is under construction,
– people living in the region of the city, where a zone of greenery (which is under construction) is allocated,
– people living in other regions of the city, far from a zone of greenery,
– local NGOs,
– media,
– local authorities,
– national and international ecological organizations.

1.3. Using the information available and according to the role the group plays, students start brainstorming.

1.4. When students are ready with solutions, each group presents its own results and tries to convince the competitors.

1.5. After presenting individual results and getting the conflict of interests, students are to interact between groups to come to one common solution. It can happen that the teacher's help will be needed at this stage.

1.6. The teacher gives general comments to the case study.

3.2. Simulation game example

The project "Community based approach to local development" is funded by the European Union and is co-financed and implemented by UNDP with the support of Ukrainian government.1 The aim of the project is to stimulate sustainable social and economic development by facilitating initiatives of community members and authorities in prioritization and solution of local level problems. The community members have to self-organize themselves in order to establish formal community organizations, to design and to implement micro projects with organizational and financial support from the UNDP and the local authorities. The project provides small grants (in average 150000 UAH) to community organizations to implement their priorities on a self-help basis and within the framework of public-private partnership. Whereby each partner shares a portion of the development cost. The established mechanism is that half of the budget must be financed with contributions of local community members (not less than 5%), local authorities, the private sector, while UNDP will contribute up to remaining half of the cost. The community takes responsibility to maintain the resulting output and reap benefit from it on a sustained basis with support from the local authorities. The mechanism of financing can be considered as one of important mechanisms, which could motivate the community members to self-organization, initiative work and fruitful cooperation with the authorities. The project is one of the most large-scales projects of economic cooperation and social mobilization of the rural community members in the history of Ukrainian independence [Grazhevska, Petrushenko & Kostyuchenko 2013: 35].

Step-by-step directions

2.1. Students are divided into several groups (minimum – three, maximum – six):

1. One group acts as representatives from UNDP "Community based approach to local development".

2. Another group acts as representatives of local authorities.

3. The rest of groups act as community members. There can be one or several communities involved (according to the number of students playing the game and according to the number of groups). The more groups act as communities the more the competition is (as it is predicted that only one community will benefit out of the project and will get the funding).

---

[1] http://cba.org.ua/en [30.11.2015].

2.2. The teacher explains the task:

1. Communities need to write proposals helping to solve the most urgent local problem to apply for small grants from UNDP "Community based approach to local development". They also need to complete all the documents required by the project.

2. UNDP representatives choose the best application for granting as well as help the communities with the documentation procedure.

3. Local authorities vote for the best application according to the strategy of local territory development.

Thus, every group of students has its own role and tasks, and needs to interact.

The group of UNDP representatives runs traineeship for community members to teach them to create formal community organization, which is obligatory to apply for the project. They also help community members with documentation, explaining what types of documents are needed. For that purpose students study documents available on the official website of the project.

The groups of community members vote for the most urgent local problems and decide which one has to be solved the first. They create a formal community organization, write a proposal and learn to interact with local authorities.

Local authorities' group checks if the proposal by the community matches the strategy of local territory development, if the question the community tries to solve is urgent. The group also creates local regulations.

2.3. The game needs lots of time and can run several classes. Students need time to prepare (to read the documents, to think the problems over, to analyze the ideas). Students also need to interact both within the groups and between the groups.

2.4. Students present their results.

2.5. The teacher can judge and give some general comments.

3.3. Debates examples

Possible topics / statements for debates on sustainable development issues:

1. Refusal of nuclear energy is the path to sustainable development.

2. Globalization processes promote sustainable development of society.

3. To implement the concept of sustainable development the humanity must start to regulate fertility.

4. Shale gas extraction is an effective way to energy independence of Ukraine.

5. The pros and cons of introducing harsh penalties for non-compliance of sustainable development standards.

6. The pros and cons of decentralization.

Step-by-step directions

3.1. The teacher announces the question/statement for debate, and he or she acts as a Chairman during the debate.

3.2. Students are divided into two groups of four peoples (two teams) and act according to their roles in terms of strict time limit. Sometimes there can also be more than two debating groups. Then there are several rounds of debate in one session.

3.3. There are also judges/experts who will define the winner at the end of debate. Often invited teachers act as judges. But it can also be an additional group of students who will be responsible for that role.

3.4. There is also one more person responsible for time keeping.

3.5. When debate is finished each judge/expert expresses his or her view on every team, indicates positive points in discussion, and makes assessment.

3.6. The Chairman announces the winner of debate and gives general comments to all the participants.

4. Conclusion

There is a broad support for active teaching/learning methods analyzed in the paper. Such methods help to engage students for learning, and make the learning process more interesting and more close to real-life problems. Examples from local communities' experience can be especially useful for education for sustainability. However, active teaching methods are not the cure for all educational problems. And the question needs additional investigation in frames of different specialties and peculiarities of different fields of study.

References

Akinsola M.K., Animasahun I.A., 2007, The effect of simulation – games environment on student's achievement in and attitude to mathematics in secondary schools, *The Turkish Online Journal of Educational Technology*, 6(3), http://files.eric.ed.gov/fulltext/ED500054.pdf [10.10.2015].

Barkley E.F., 2010, *Student engagement techniques: A handbook for college faculty*, New York: Jossey-Bass.

Becker B.A., 2015, *A new meta-model of student engagement: The roles of student motivation and active learning*, Conference Paper, Ireland International Conference on Edu-

cation, Dublin, www.brettbecker.com/wp-content/uploads/2015/05/IICE-13-_
Becker_-419_Camera-Ready.pdf [30.11.2015].

Dale E., 1969, *Audiovisual Methods in Teaching*, New York: Dryden Press.

Dopovid pro stan navkolyshnyoho pryrodnoho seredovyshha v Sumskij oblasti u 2011 roci,
Sumy, 2012, Report on the state of the environment in Sumy region in 2011.

Geddes P., 1915, *Cities in Evolution*, London: Williams, https://ia800302.us.archive.
org/12/items/citiesinevolutio00gedduoft/citiesinevolutio00gedduoft.pdf [20.10.
2015].

Grazhevska N., Petrushenko Y., Kostyuchenko N., 2013, Impact of social capital charac-
teristics on the effectiveness of community-based approach to local development,
Bulletin of Taras Shevchenko National University of Kyiv, 11(152): 34-39.

Gough N., 2002, Thinking/acting locally/globally: Western science and environmental
education in a global knowledge economy, *International Journal of Science Education*
(Special Edition: *Environmental Education and Science Education*), 24(11): 1217-
1237.

http://cba.org.ua/en [30.11.2015].

International debate education association "Idea" (2004), *Karl Popper Debate*, http://ide-
bate.org/sites/live/files/standards/documents/rules-karl-popper.pdf [20.11.2015].

Kostyuchenko N., Petrushenko Y., 2012, Green-belt zones in danger, in: *Crisis manage-
ment and conflict prevention in Eastern Europe and the Balkans: lessons for Ukraine-EU
cooperation*, eds. T. Malyarenko, S. Wolff, Donetsk: East Publishing House.

Loon M., Evans J., Kerridge C., 2015, Learning with a strategic management simulation
game: A case study, *The International Journal of Management Education*, 13: 227-236.

Malawi Institute of Education, 2004, *Participatory teaching and learning a guide to meth-
ods and techniques*, www.equip123.net/equip1/mesa/docs/ParticipatoryTeachin-
gLearning.pdf [25.09.2015].

Monash University Library, 2007, *QuickRef 27. How to write the case study*, www.monash.
edu.au/lls/llonline/quickrefs/27-case-study.pdf [26.11.2015].

Osborn A.F., 1963, *Applied imagination: Principles and procedures of creative problem solv-
ing*, New York: Charles Scribner's Sons.

Oxford Union style debate, *Sequence & History*, www.ecgi.org/conferences/ fese_efmc
2005/ou_rules.htm [20.11.2015].

Public debating in principle and practice, 2011, British Council, www.youngarabvoices.
org/sites/default/files/training-materials/public_debating_-principle_and_prac-
tice.pdf [15.10.2015].

Resources for Graduate Instructors and Teaching Assistants, Center for Excellence in
Teaching and Learning University of Mississippi, http://cetl.olemiss.edu/Grad%20
Files/Resources.pdf [30.11.2015].

Rilstone A., 1994, *Role-playing games: An overview*, www.rpg.net/oracle/essays/rpgover-
view.html [6.10.2015].

Shaffer D.W., Squire K., Halverson R., Gee J.P., 2005, Video games and the future of
learning, *Phi Delta Kappan*, 87(2): 104-111.

Sutcliffe M., 2002, *Simulations, games and role-play*, University of the West of England,
www.economicsnetwork.ac.uk/handbook/games/ [6.10.2015].

The official website of the United Nations Development Program "Community based
    approach to local development", http://cba.org.ua/en [11.11.2015].

Thomas G., 2011, A typology for the case study in Social science following a review of
    definition, discourse and structure, *Qualitative Inquiry*, 17(6): 511-521.

Zantow K., Knowlton D.S., Sharp D.C., 2005, More than fun and games: Reconsidering
    the virtues of strategic management simulations, *Academy of Management Learning
    & Education*, 4(4): 451-458.

Aktywne metody nauczania
w edukacji dla zrównoważonego rozwoju
na przykładzie dobrych praktyk
stosowanych w lokalnych społecznościach

Streszczenie. Artykuł jest poświęcony wykorzystaniu aktywnych metod nauczania/uczenia się
w ramach edukacji dla zrównoważonego rozwoju. Metody aktywne, takie jak: jak studium przy-
padku, gry symulacyjne, debaty czy ćwiczenia z podziałem na role, opisano krok po kroku w po-
staci szczegółowych wytycznych. Podano również przykłady dobrych praktyk w zakresie eduko-
wania na rzecz zrównoważonego rozwoju, zaczerpnięte z życia lokalnych społeczności.

Słowa kluczowe: edukacja dla zrównoważonego rozwoju, aktywne metody nauczania, zaanga-
żowanie studenta, studium przypadku, gra symulacyjna, debata, ćwiczenia z podziałem na role,
burza mózgów, społeczności lokalne

Sɪɴɪᴋᴋᴀ Sᴜᴏᴍᴀʟᴀɪɴᴇɴ*

A European Project
for the Education for Sustainable Development
in Higher Education

Abstract. University Educators for Sustainable Development (UE4SD) is a 3-year project (2013-2016) with 53 partners from 33 countries across Europe supporting teaching and learning for sustainability in higher education, and providing support and resources for professional development of educators. The main results include identifying the best practice examples of professional development in education for sustainable development (ESD) for European university educators, developing an online platform resource, and an academy of ESD. A mapping of opportunities for university teachers´ competence development in education for sustainable development has been carried out. Based on four regional reports (Northern, Southern, Eastern, and Western Europe) this state of the art report was compiled. The best practices of the mapping are published in the Leading Practice Publication including insights into the status of ESD and strategies. An online platform of resources will be further developed for support of university educators' competences. One of the main outputs will be developing an Academy for ESD in higher education in Europe. The project is funded by the European Commission, and Life Long Learning Programme (LPP) – academic networks.

Keywords: sustainable development, higher education, university educators, competence development, ESD

1. Introduction

University Educators for Sustainable Development (UE4SD) is a three year project (2013-2016) supporting the development of education for sustainable development (ESD) capabilities of university educators in Europe. All educators in higher education are included in the project, in line with the following defini-

  * Centre for Lifelong Learning, Åbo Akademi University, Finland, e-mail: sinikka.suomalainen@abo.fi, phone: +358 2 215 4870.

tion: "University educator is person who has teaching responsibilities in a higher education institution, which covers universities, universities of applied science and institutes or colleges of higher education" [UE4SD 2014c]. At universities, these persons have usually the role of both researchers and teachers. Important to emphasize is that the project concerns university educators from all disciplines. The project involves 53 partners in higher education from 33 countries across Europe taking into account the geographical balance. The main deliverables of this project are mapping of existing opportunities for teacher's competence development in education for sustainable development in partner countries and identifying leading practice. Development of an online resource enhancing learning and education in ESD is part of the project. Further, the project will contribute to the establishment of an Academy of ESD in higher education in Europe. The project is funded by European Commission, Life Long Learning Programme (LPP) – academic networks. The lead partner of the project is University of Gloucestershire, UK (North hub), three core partners are the Autonomous University of Madrid, Spain (South hub), Charles University in Prague, Czech Republic (East hub) and

Figure 1. Map showing the UE4SD partner institutions grouped into four regional hubs: North – white, South – black, East – dark grey, West – striped dove grey. Stars mark the four coordinating institutions

Leuphana University of Lüneburg, Germany (West hub). The project is closely associated with the Copernicus Alliance – the European Network of Higher Education for Sustainable Development [UE4SD 2014a, 2014b].

2. International and regional background

The project started in an especial time period: in the end of United Nations (UN) Decade of ESD (DESD 2005-2014) and in the beginning of the UN Global Action Programme (GAP) on ESD (2015-2030) driven by UNESCO. In parallel the 8 UN Millennium Development Goals (MFGs 2000-2014) which focused mainly on developing countries are followed by the 17 Sustainable Development Goals (SDGs) which seek to complete what MDGS did not achieve. These global SDGs are addressed to all countries in the world, developing and developed, to be obtained by 2030 [UE4SD 2015b; UNESCO 2014a, 2014b; United Nations 2015]. Besides, the Rio 20 Treaty on Higher Education underlines transformation and a paradigm shift in education to achieve sustainable development goals [Copernicus Alliance 2012].

Among the regional documents can be mentioned the United Nations Economic Commission for Europe (UNECE) Strategy on Education for Sustainable Development adopted in Vilnius in 2005 [UNECE 2005] and the report on Competences in Education for Sustainable Development by UNECE [UNECE 2011].

3. ESD competences for educators

The UNECE expert group [UNECE 2011] presented three key competences for educators specifically regarding ESD: a holistic approach, envisioning change and achieving transformation. A holistic approach includes interrelated components: integrative thinking, inclusivity and dealing with complexities. Envisioning change comprises competences related to learning from the past, inspiring engagement in the present and exploring alternative futures. Achieving transformation includes competences at different levels: transformation of what it means to be an educator (personal level), transformation of pedagogy (pedagogy level) and transformation of the education system as whole (education systems level). The three key ESD competences were combined with four pillars of learning by Jacques Delors [1996]: learning to know, learning to do, learning to live together and learning to be. These combinations give forty specific ESD competences described by the UNECE expert group. As examples of these specific ESD com-

petences described are "the basics of system thinking; ways in which natural, social and economic systems function and how they may be interrelated," "the independent nature of relationships within the present generation and between generations, as well as those between humans and nature" (holistic approach; learning to know;) and "the importance of problem setting, critical reflection, visioning and creative thinking in planning for future and effecting change" (envisioning change; learning to know). ESD is also related to competences to 1) learning to ask critical questions; 2) learning to clarify one's own values, 3) learning to envision more positive and sustainable futures, 4) learning to think systemically, 5) learning to respond through applied learning, 6) learning to explore the dialectic between tradition and innovation [Tilbury 2011]. Future thinking, critical and creative thinking, participation and participatory learning, partnerships and systemic thinking were key ESD principles identified by Daniella Tilbury and Ingrid Mulá [2009].

4. Mapping of opportunities for teachers' competence development in ESD

During the first year of the project a mapping of the existing professional development opportunities in higher education was carried out in partner countries. The national mappings from the four regional hubs North, South, East and West were developed to four regional reports by regional hub coordinators. The UN-ECE Competence Framework for Educators in ESD with forty described competences [UNECE 2011] formed a basis for the mapping of educator´s competences [UE4SD 2015b]. Information of the status of ESD at national level such as policies and initiatives was also asked for in the mapping. From the four regional reports, the state of art report was compiled based on 53 partner universities from 33 countries [UE4SD 2014c].

5. Key findings from the mapping across the partner countries and Leading Practice Publication

Half of the countries reported existence of national strategies or action plans on sustainable development or ESD. Only three countries reported that ESD is a part of quality assurance and accreditation processes of higher education [UE4SD 2014c]. In this mapping in total nearly 70 professional development

opportunities in ESD for university educators were identified. Of them 27 were categorised as good practice examples with clear focus and approach to developing ESD competences. These good practice examples are described shortly in the State of the art report [UE4SD 2014c]. They include different types of professional development opportunities as short courses, seminars, mentoring/coaching programmes, academic working groups, work shadowing, teaching support initiatives, staff introduction and in-house certification for new teaching staff. Most of these were continuing activities. Integration of ESD in higher education and exchange and networking opportunities were especially mentioned as special values of the professional development opportunities.

Analysis of the regional reports show that it is not possible to draw valid conclusions for all participating countries about the ESD professional developments opportunities, but some trends can be observed. Only a few countries have programmes in ESD for university educators and the same situation is observed regarding the comprehensive and mandatory programmes for university teachers to acquire teaching competence. Attending professional development opportunities in ESD is therefore mostly depending of the individual university educator's personal interest [UE4SD 2014c].

The best practices from the results of the mapping were published in the Leading Practice Publication launched in November 2015. It presents different types of case studies (networks, national programs, initiatives) across Europe showing 13 cases from 10 partner countries, from small-scale institutional initiatives to large-scale international projects. The UE4SD project has identified three key target groups: educators primarily in higher education, university leadership and policymakers [UE4SD 2015b]. Below describes one example of international networks and one example of the national initiatives.

One of the best practice examples of international networks is MedUnNET, the Network of the Mediterranean Universities for Sustainable Development focusing on Education for Sustainable Development, launched in 2008 in Athens. The coordinator of the network is the National and Kapodistrian University of Athens, with the UNESCO Chair on Sustainable Development Management and Education in the Mediterranean. Twenty member universities from 15 Mediterranean countries build the core of the MedUnNET. The network is open for interested HEIs, without fee by now. The aim of the network is developing the ESD competences of university staff, promoting a "whole institution approach" in HEIs, providing a forum for consultation on ESD among universities and key-stakeholders and synergising the individual activities for the benefit of ESD. Furthermore, the goal is to develop a joint Mediterranean Master course in ESD. The network focuses on the key ESD competences according to UNECE [2011]. MedUnNET has organised ESD training events where approximately 500 university staff from Mediterranean countries has been trained. Trainings consist of

a shorter theoretical part and a longer experiential part with workshops, group work, working in pairs. MedUnNET is in close connection to other networks and partners such as MEdIES (Mediterranean Education Initiative for Environment and Sustainability Network) with about 4000 educators of all levels of formal, non-formal and informal education, MIO-ECSDE (the Mediterranean Information Office for Environment, Culture and Sustainable Development), COMJESD (Circle of Mediterranean Journalists for Sustainable Development) and others. MedUnNET has also supported the drafting of the Mediterranean Strategy for ESD [Scoullos & Malotidi 2015].

One best practice example representing the national level is "Green academy" – a programme for organisational ESD change at UK universities launched 2011. It is an initiative of the UK agency for teaching and learning development in higher education, Higher Education Academy (HEA). It follows a model from "Change academy" which has been practiced since 2004 with focus on professional development and team development supporting an institutional change in ESD: "Green academy" has supported 18 institutional ESD change projects starting 2011 (8 projects) and 2013 (10 projects). Institutions are invited to propose projects plans to form staff teams consisting 5-6 people for implementing proposals. The teams have to include one senior manager, one student, one member of academic and one from operational staff. HEA provides a one-year supporting facilitation process with mentors for the team, and some financial support. The one-year process starts with a meeting with mentors and the team leaders from different universities. Each team will have a facilitating mentor. The second step is 2-days residential event for teams and mentors to support developing of plans. The process of implementing is supported by the mentor during the year. In the end is a team leader meeting. Teams shall write a report and arrange a workshop to share their experiences. This process supports learning of strategy development skills and learning from other universities practices, for individuals, teams and institutions. Among assessed impacts reported is a change on the strategic level for institutions in embedding ESD and raising awareness. The process stimulated various staff development activities such as workshops, seminars, auditing of ESD in the curriculum, development of workbooks and toolkits [Ryan & Tilbury 2015].

6. Online platform of resources

One of the main outputs of the project is the online platform of ESD professional development resources. The platform will be developed during the project to support university educators in all disciplines by sharing experiences, tools and

best practices. Project news, information, activities and UE4SD publications are available on the project website http://www.ue4sd.eu/.

7. Developing an Academy for ESD in higher education

The final stage of the project will concentrate on the development of an Academy for ESD in higher education in Europe to support university educators to develop their ESD competencies. The aim is to plan a professional development programme to enhance ESD capabilities. Piloting of this initiative is included in the project under the lead of Autonomous University of Madrid. Four universities in Spain participate in this piloting with different piloting projects: Autonomous University of Barcelona, University of Girona, University of Basque Country and University of Granada. The experiences of the piloting will result in a report [UE4SD 2015b].

8. Conclusion

Sustainable development is a great challenge at many levels: global, regional, national and local. Higher education is in key position equipping the future generation of professionals to meet the challenges. UNECE [2011] developed a framework for educators´ competences in ESD with the essential characters of ESD: a holistic approach, envisioning change and achieving transformation. In higher education especially the holistic perspective and inter- or transdisciplinary approach should be emphasized [UE4SD 2015b]. Reorientation of curriculum and pedagogy is needed for transformation of the higher education sector (Copernicus Alliance). University networks and partnership support many aspects of ESD. As examples of large networks in higher education supporting ESD in Europe are the Baltic University Programme, BUP [Lindroos 2015] and the Network of Mediterranean Universities for Sustainable Development, MedUnNET [Scoullos & Malotidi 2015]. In the coming years, it is expected that networks and networking of networks, cooperation and partnerships in higher education will support and give more opportunities for university educators' professional development in ESD.

References

Copernicus Alliance, 2012, Rio +20 Treaty On Higher Education, http://hetreatyrio20. com/wordpress/wp-content/uploads/2013/06/treaty_rio.pdf [15.02.2016].

Delors J. at al., 1996, *Learning: the treasure within: report to UNESCO of the International Commission on Education for the Twenty-first Century*, Paris: UNESCO [10.03.2016].

Lindroos P., 2015, Introducing education for sustainable development – challenges for students and teachers, in: *Sustainable Development, Knowledge Society and Smart Future Manufacturing Technologies, World Sustainability Series*, eds. W.L. Filho, A. Úbelis, D. Bērziņa, Berlin: Springer.

Ryan A., Tilbury D., 2015, Green Academy: Programme for organisational ESD change at UK universities, in: *Leading Practice Publication: Professional development of university educators on Education for Sustainable Development in European countries*, eds. D. Kapitulčinová et al., Prague: University in Prague.

Scoullos M., Malotidi V., 2015, MedUnNET: Mediterranean professional development network for ESD, in: *Leading Practice Publication: Professional development of university educators on Education for Sustainable Development in European countries*, eds. D. Kapitulčinová et al., Prague: University in Prague.

Tilbury D., Mulà I., 2009, R*eview of Education for Sustainable Development Policies from a Cultural Diversity and Intercultural Dialogue: Gaps and Opportunities for Future Action*, Paris: UNESCO, http://unesdoc.unesco.org/images/0021/002117/211750e. pdf [24.02.2016].

Tilbury D., 2011, *Education for Sustainable Development: An Expert Review of Processes and Learning*, Paris: UNESCO, http://unesdoc.unesco.org/images/0019/001914/ 191442e.pdf [24.02.2016].

UE4SD, 2014a, *The UE4SD project leaflet*, www.ue4sd.eu/outcomes/leaflets-in-project-languages [30.11.2015].

UE4SD, 2014b, *UE4SD Newsletter 1, University Educators for Sustainable Development. An Erasmus Partnership of 55 members in 33 countries*, www.ue4sd.eu/images/Newsletters/UE4SD_Newletter_14.pdf [30.11.2015].

UE4SD, 2014c, *Mapping opportunities for professional development of university educators in Education for Sustainable Development: A state of the art report across 33 UE4SD partner countries*, authors: M. Mader et al., Cheltenham: University of Gloucestershire, www.ue4sd.eu/images/RegionalMapping/UE4SD_State-of-the-art-report. pdf [30.11.2015].

UE4SD, 2015a, *UE4SD Newsletter 3, University Educators for Sustainable Development. An Erasmus Partnership of 53 members in 33 countries*, www.ue4sd.eu/images/Newsletters/UE4SDNewsletter15_03.pdf [30.11.2015].

UE4SD, 2015b, *Leading Practice Publication: Professional development of university educators on Education for Sustainable Development in European countries*, eds. D. Kapitulčinová et al., Prague: University in Prague, www.ue4sd.eu/images/2015/UE4SD-Leading-Practice-PublicationBG.pdf [30.11.2015].

UNECE, 2005, *UNECE Strategy on Education for Sustainable Development*, www.unece. org/environmental-policy/education-for-sustainable-development/about-the-strategy-for-esd/the-strategy.html [30.09.2015].

UNECE, 2011, *Learning for the future: Competences in Education for Sustainable Development*, ECE/CEP/AC.13/2011/6, www.unece.org/fileadmin/DAM/env/esd/ESD _Publications/Competences_Publication.pdf [16.10.2015].

UNESCO, 2014a, *Shaping the Future We Want – UN Decade of Education for Sustainable Development (2005-2014) Final Report*, http://unesdoc.unesco.org/images/ 0023/002301/230171e.pdf [4.12.2015].

UNESCO, 2014b, *Roadmap for implementing the Global Action Programme for Education for Sustainable Development*, Paris, http://testplatform.cozpserver3.jinonice.cuni.cz/ downloads/UNESCO_GAP_Roadmap_2014.pdf [24.02.2016].

United Nations, 2015, *Transforming our world: The 2030 Agenda for Sustainable Development*, A/RES/70/1, https://sustainabledevelopment.un.org/content/documents/ 21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf [4.12. 2015].

Europejski projekt edukacyjny dla szkolnictwa wyższego na rzecz zrównoważonego rozwoju

Streszczenie. University Educators for Sustainable Development (UE4SD) to rozpisany na trzy lata (2013-2016) projekt, w którym uczestniczy 53 partnerów z 33 krajów całej Europy i którego celem jest wsparcie szkolnictwa wyższego w zakresie nauczania i uczenia się na rzecz zrównoważonego rozwoju oraz zapewnienie narzędzi i zasobów dla rozwoju zawodowego nauczycieli uniwersyteckich. Do najważniejszych rezultatów projektu należy: zidentyfikowanie przykładów dobrych praktyk w zakresie rozwoju zawodowego europejskich nauczycieli akademickich, stworzenie internetowej platformy edukacyjnej oraz powołanie do życia akademii edukacji na rzecz zrównoważonego rozwoju. W pierwszym etapie przeprowadzono mapowanie szans związanych z rozwojem kompetencji wykładowców akademickich w ramach edukacji na rzecz zrównoważonego rozwoju. Na podstawie czterech regionalnych raportów (dla Europy północnej, południowej, wschodniej i zachodniej) powstał raport zbiorczy, dający całościowy obraz sytuacji. Następnie opublikowano „Leading Practice Publication", w którym zawarto nie tylko mapę dobrych praktyk, ale również pogłębioną analizę obecnej sytuacji i strategię dalszych działań w zakresie edukacji dla zrównoważonego rozwoju. Internetowa platforma będzie dalej rozwijana, stanowiąc wsparcie dla kształcenia kompetencji nauczycieli akademickich. Jednym z głównych efektów będzie utworzenie w strukturach europejskiego szkolnictwa wyższego Akademii Edukacji dla Zrównoważonego Rozwoju. Projekt jest finansowany przez Komisję Europejską w ramach programu „Uczenie się przez całe życie" (LPP).

Słowa kluczowe: zrównoważony rozwój, szkolnictwo wyższe, nauczyciele akademiccy, rozwijanie kompetencji, edukacja dla zrównoważonego rozwoju

Mikhail Nikishin*, Daniil Krymov**, Natalia Ivanova***

E-educational Resource for Simulator Training of Marine Engineers and Bachelors in Engineering

Abstract. Sustainable development of the Baltic Sea region cannot be imagined without the continuous improvement of the quality of higher education. Maritime and ecological education takes a special role in the development of this region. Shipping has always had a significant impact on the environmental safety of the Baltic Sea. Safe and reliable operation of a ship's equipment allows to minimize pollution from ships. The electronic educational resource TotDesigner has been developed for simulator training of marine engineers and bachelor students in the sphere of engineering. This resource allows for the study of the principles of operation, as well as, the design of machines and devices used in maritime and coastal engineering. Through the use of TotDesigner it is also possible to solve various operational tasks. The TotDesigner system may be used in lectures, and in laboratory and practical exercises to consolidate theoretical knowledge and practical skills. The next step in the development of the software is to use mathematical modelling to predict the working modes of the ship's refrigeration plant. The implementation of this idea will improve the quality of a bachelor student's scientific-research competence formation in the sphere of engineering.

Keywords: electronic educational resource, simulator training, maritime education, bachelor, scientific-research competence

1. Introduction

Sustainable development of the Baltic Sea region can not be imagined without the continuous improvement of the quality of higher education. Maritime educa-

* Baltic Fishing Fleet State Academy, Kaliningrad, Russia, e-mail: miknik39@rambler.ru, phone: 892 161 668 74.

** Baltic Fishing Fleet State Academy, Kaliningrad, Russia, e-mail: asu.daniil@gmail.com, phone: 890 056 323 45.

*** Kaliningrad Marine Fishing Industry College, Kaliningrad, Russia, e-mail: nado_1@mail.ru, phone: 891 147 254 63.

tion takes a special role in the development of the region, namely training naviga-tors, marine engineers and refrigeration engineers. Efficiency and safety of the vessel operation depends on the quality of their training.

A ship is one of the sources of pollution of the marine environment and at-mosphere by different harmful substances, such as petroleum products (fuel, oil), waste water, garbage and emissions from the operation of internal combustion engines and refrigeration units [Slastikhin, Eydeyus & Eliseev 2014: 162-251]. This problem is very actual for the semi-closed type of sea such as the Baltic Sea, the Black Sea etc.

Modern ships are equipped with the necessary devices and mechanisms to prevent the discharge of oil-contaminated water (bilge water) overboard, for cleaning and disinfection of waste water, for recycling garbage and preventing the release of refrigerant into the atmosphere.

To minimize pollution from the ship it is necessary to follow two ways: 1) improving quality of marine engineer's training; 2) using modern devices and mechanisms for preventing pollution.

The training of Marine Engineers is impossible without computer simulator practice. There are a lot of different computer simulators, which are used in the marine education, but most of them allow students to solve only operation tasks.

The electronic educational resource TotDesigner has been developed for sim-ulator training of marine engineers and bachelors in the sphere of engineering. Us-ing this e-resource it is possible to form the scientific-research competence of bach-elors in engineering, who want to continue their education to get master's degree.

2. Main provisions

The information technology is currently widely used in the training of marine engineers and bachelors in engineering [Ganieva & Krymov 2009: 63-64]. As mentioned above, there are a lot of different simulators and some of them are made in the form of computer game. Unfortunately, almost all of the existing simulators do not allow to study design and the working principle of various machines and mechanisms. The effective and safe operation of any equipment is impossible without knowledge of its design and working principle. In this re-gard, in 2011 on the Department of Refrigerating, cryogenic equipment and air conditioning (BFFSA, Kaliningrad) the development of the computer simulator for studying the structures and working principle of machines and apparatus of ships' refrigeration plant was started. The result of this work is the electronic edu-cational resource TotDesigner, which functions are not limited by studying the refrigeration plant.

The basic working principles of this program are described in the sources [Krymov, Nikishin & Ivanova 2011: 296-298; Nikishin, Krymov & Ivanova 2012: 83-89], that is why only some information about e-educational resource will be presented in this article. The basic idea of a computer simulator is that marine engineers should study design and working principle of machines and apparatuses and consolidate their knowledge. After a student has successfully completed all the tasks, concerning the design and working principle of the device, he/she begins to solve basic operational tasks, thus acquiring the necessary skills for the operation of certain equipment. Fig. 1 is a screenshot of one of the apparatuses of refrigeration plant when you are working with the computer simulator.
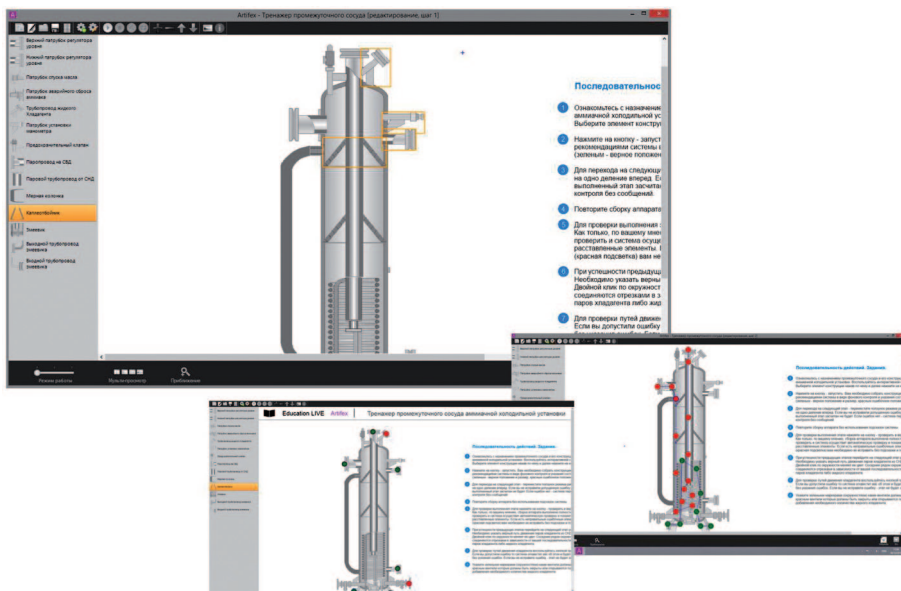

Figure 1. The example of work with the computer simulator of intermediate vessel

Source: Nikishin, Krymov & Ivanova 2012.

In the first stage the student must assemble the apparatus or mechanism using suggested elements of it. Second stage is to indicate moving direction of main working substances inside the apparatus. Third stage is to solve operational tasks (for example, preparing for start, start, stop, serving during work and etc.).

The main feature of the e-educational resource is that its software platform may be used to study the machines and apparatus of various plants, for example, not only the ships' refrigeration plants, but also power plants. To do it you must have a sufficient amount of data, drawings and diagrams of real equipment. For example, using this e-educational resource, students can study the design of die-

sel engines, boilers, diesel generators and other main and auxiliary machinery of the ship power plant.

Now TotDesigner is actively introduced in school education, where it is used to study a variety of subjects such as biology (studying human body), astronomy (studying our solar system), geography etc. (Fig. 2).
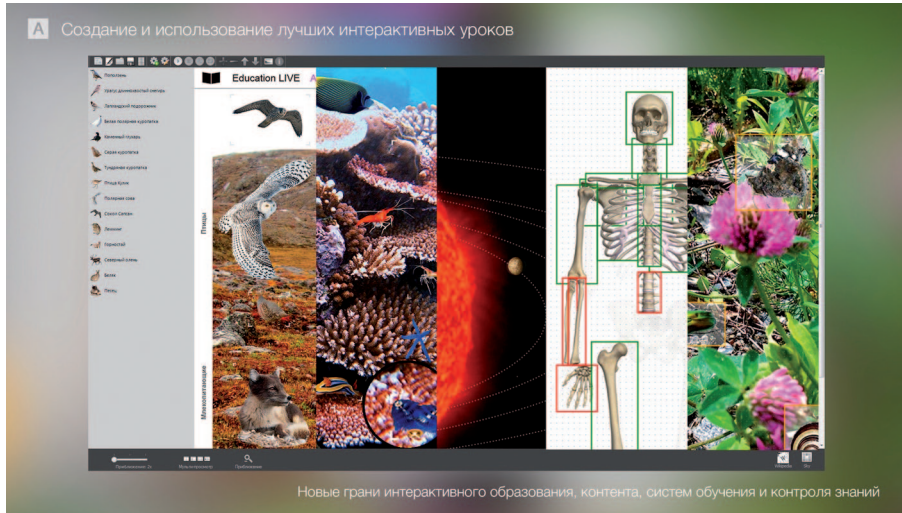

Figure 2. The example of using TotDesigner in school education

Source: own elaboration.

You can review all possibilities of the e-educational resource on our web-site http://balticitc.jimdo.com.

The next step in the development of the e-resource is application of mathematical modeling to predict the working modes of the ship's refrigeration plant. Ship's refrigeration plant operates in highly changeable environment, which influences the efficiency and reliability of plant operation. Using mathematical modeling, it is possible to calculate all the operating parameters under different external conditions. The implementation of this idea will improve the quality of the formation of the scientific-research competence of bachelors in engineering.

Scientific-research competence of the future bachelor in engineering is integrative quality of his/her personality based on the motivation and value priorities regarding research activities [Serykh & Nikishin 2013: 151-153]. This quality includes, on the one hand, the ability to make independent decision concerning creative and research tasks and skills of scientific research. On the other hand it is readiness to take the position of a researcher in the scientific, technical and industrial spheres. The content of the scientific-research competence of the bachelor

in engineering is a complex synthesis of intellectual and social experience and, accordingly, is characterized by diversity and interaction of various components – cognitive, motivational, and operational.

The cognitive component includes the complex of knowledge about the object/phenomenon being researched, scientific knowledge, theoretical and methodological foundations of the scientific-research activities, a high level of logical, creative, critical, analytical and research thinking, as well as the skills necessary for formulating and solving scientific-research problems in technical and industrial spheres.

Motivational component is inner motivation for scientific and educational activity, a high level of interest in research work, in professional activity, independence in the process of scientific learning, self-motivation, a manifestation of strong-willed qualities of the person in achieving their scientific-research goals and motivational readiness for the development and realization of scientific-research activity.

The operational component demonstrates the ability of the future bachelor in engineering to produce scientific researches, articles, reports, etc., to work in task groups, to work with modern information technology and database of scientific data, as well as the ability to analyze actual scientific problems in their own professional activity.

Formation of scientific-research competence of the bachelors in engineering can be accomplished through a number of activities: 1) the introduction of an optional lecture course "young researcher," 2) participation in the Student Scientific Society and the research work of the department, 3) participation in scientific conferences, 4) using of various forms of information technology in the education process.

It is understood that the using of mathematical modeling in our e-educational resource will help to improve the efficiency of the formation of the scientific-research competence operational component. Any bachelor who wishes to continue their education to get Master's degree should be able to apply mathematical modeling in their scientific research.

It should be noted that the introduction of mathematical modeling to predict the working modes of ships' refrigeration plants in e-educational resource Tot-Designer is very time-consuming and complicated process.

3. Conclusion

The Baltic Sea is a semi-closed type and special attention is paid to its ecology. Despite the existing of the Convention for the Prevention of Pollution from Ships, it

is impossible to avoid the transfer of pollutants into the sea. Nowadays the most common reason of this is the "human factor." This is poor quality of training of marine engineers, lack of knowledge about structures and working principle of ship equipment that leads to the transfer of pollutants into the sea. In this regard, in addition to training on board of the ship, it is absolutely necessary to improve the simulator training of engineers who want to work at sea and plan to be busy in project activities.

References

Ganieva R., Krymov D., 2009, Modern Information Technologies in Education: Status, Prospects, in: *The problems of inter-regional relations – Research Almanac*, Saint-Petersburg: Science.

Krymov D., Nikishin M., Ivanova N., 2011, Project of simulator for apparatus and machinery refrigeration equipment for the preparation of refrigeration engineers, in: *Marine industry, transport and logistic in countries of Baltic Sea region: New challenges and responses. IX International conference*, Kaliningrad: BFFSA.

Nikishin M., Krymov D., Ivanova N., 2012, Simulator training of marine engineers, in: *AGA 13 Expanding Frontiers – Challenges and Opportunities in Marine Education and Training*, eds. R. Mercer, J. Cross, C. McCulloch, Saint John: The Fisheries and Marine Institute of Memorial University of Newfoundland.

Serykh A., Nikishin M., 2013, Structure of scientific-research competence of the bachelors in the area of refrigeration and cryogenic technique, *Science and business: ways of development*, no. 4: 151-153.

Slastikhin Y., Eydeyus A., Eliseev E., 2014, *Technical exploitation of ship refrigeration plants*, Moscow: Morkniga.

Elektroniczne zasoby edukacyjne dla szkolenia symulatorowego na studiach inżynierskich i licencjackich na kierunku inżynieria morska

Streszczenie. Trudno sobie wyobrazić trwały i zrównoważony rozwój regionu Morza Bałtyckiego bez ciągłego doskonalenia jakości studiów wyższych. Szczególne znaczenie dla rozwoju regionu ma edukacja morska i ekologiczna. Żegluga zawsze istotnie wpływała na bezpieczeństwo ekologiczne Bałtyku. Bezpieczna i odpowiedzialna eksploatacja osprzętu jednostek pływających pozwala zminimalizować ryzyko zanieczyszczeń powodowanych przez statki. TotDesigner to elektroniczne narzędzie edukacyjne, które zostało stworzone do celów treningu symulatorowego absolwentów wyższych studiów morskich. Pozwala ono na przybliżenie zasad działania oraz konstrukcji maszyn i urządzeń używanych w inżynierii morskiej i brzegowej. TotDesigner może być ponadto wykorzystywany do wielu zadań operacyjnych. System może również znajdować zasto-

sowanie w sali wykładowej, uczelnianym laboratorium i w czasie ćwiczeń praktycznych dla utrwalenia teoretycznej wiedzy i rozwijania praktycznych umiejętności. Następnym etapem rozwoju tego oprogramowania będzie wykorzystanie modelowania matematycznego do prognozowania trybów pracy agregatu chłodniczego statku. Realizacja tego pomysłu poprawi jakość przygotowania absolwentów do pracy naukowej w zakresie nauk inżynieryjnych.

Słowa kluczowe: elektroniczne zasoby edukacyjne, szkolenie symulatorowe, edukacja morska, studia licencjackie, kompetencje naukowe

The WSB Press Instructions for Authors Submitting Contributions in English

General requirements
• only complete submissions are accepted – single printed copy and electronic source file (*.doc or *.rtf format)
• ensure your text contains no phrases by which your authorship could be identified, e.g. *In my 2008 book I pointed out*... is not allowed and should be replaced with e.g. *In his 2008 book John Smith pointed out*...

Text layout
• author's first and last name, academic degree/title
• organization/institution (if applicable)
• phone number, e-mail address, mailing address
• title of book/paper in English and Polish
• summary in English and Polish (up to 1000 words including spaces)
• keywords in English and Polish (up to 8 words)
• introduction
• body text – organized into chapters, each with unique title
• conclusion (findings, recommendations)
• bibliography – complete list of sources referenced

Size limit – up to 40 000 characters (roughly 22 pages, 1800 characters per page) including tables and figures

Margins – 2.5 cm each

Page numbering – continuous throughout the text, using Arabic numerals, placed at the bottom of page (footer)

Body text
• typeface: Times New Roman, 12 pts
• line spacing: 1.5 line
• highlights or emphasis: apply **bold** print
• foreign (non-vernacular) words and expressions: *italicized*
• people's names: give full name (including all given names and last name) at first mention; for any further references – quote last name only
• abbreviations and acronyms: when first used, give complete phrase (name), including its abbreviation in brackets, e.g. *Information and Communication Technology (ICT)*; onwards – use abbreviation only
• numbers consisting of up to 4 digits: use no thousands separator (5000 rather than 5,000 or 5 000); numbers composed of 5 or more digits – insert space every three digits starting from right (5 000 000 rather than 5,000,000)
• decimal fractions should be separated by points (2.25)

In-text citations
• placed within the text and enclosed in square brackets: author's/editor's last name, publication year [colon], page or page range, e.g.
  [Meyer 2010: 31-40] or [Dubisz (ed.) 2003: vol. 3, 104]
• when there are more than three authors, give name of first (primary) author only, followed by the phrase *et al.*:
  [Kaczmarek et al. 2005: 56-67]
• in case no author/editor is indicated, three to five initial words from title (of published work) should be quoted instead:
  [The Norton Anthology 2012]
• if reports or studies are referenced, name of sponsoring institution and year of publication should be given:
  [Eurostat 2014] or [GUS 2015]
• additional information may be included if deemed necessary or appropriate, e.g.:
  [cf. Hadzik 2009: 38] or [as cited in Szromek 2010: 52]
• when simultaneously referencing more than single source, quote these in chronological order, separating them with semicolons:
  [Mansfeld 1987: 101-123; Jagusiewicz 2001: 40-73; Meyer 2010: 89-101]
• if citing multiple works published by same author in same year, subsequent letters of alphabet should be appended to publication year to disambiguate the references, e.g.:
  [Nowak 2014a, 2014b]

Other references and footnotes
• any additional **comments** or **explanations**, references to **legislation, court rulings and decisions**, as well as links to **Websites** that are provided outside body text must be numbered consecutively and placed at the **bottom of page** (**footnote**)
• footnotes should be typeset in 10 pt font with single line spacing

Bibliography
• apply no numbering
• order all items alphabetically by last name of author/editor, or by title of cited work in case authorship is not indicated; if more than single work by same author is referenced, order these chronologically by publication date
• **journal articles** – author's last name and first name initial, publication year, title of article [no italics], *name of periodical [italicized]*, volume/issue [colon], page range:
  Spenner P., Freeman K., 2012, To keep your customers, keep it simple, *Harvard Business Review*, 90(5): 108-114.
• **books** – last name and first name initial of author/editor, publication year, *title of book [italicized]*, place of publication [colon], publisher:
  Lane W.R., King K.W., Reichert T., 2011, *Kleppner's Advertising Procedure*, Upper Saddle River, NJ: Prentice Hall.
• **chapters in edited books** – last name and first name initial of chapter author, publication year, title of chapter [not italicized], in: first name initial(s) and last name(s) of editor(s) (ed. or eds.), *title of edited book [italicized]*, place of publication [colon], publisher, page range:
  Cornwall W., 1991, The Rise and Fall of Productivity Growth, in: J. Cornwall (ed.), *The Capitalist Economies: Prospects for the 1990s*, Cheltenham, UK: Edward Elgar, 40-62.
• **legislation**
  Council Directive 90/365/EEC of 28 June 1990 on the right of residence for employees and self-employed persons who have ceased their occupational activity.
  Act of 4 February 1994 on Copyright and Related Rights, Journal of Laws No. 24, item 83, as later amended.
• **studies and reports**
  World Energy Council, 2013, *World Energy Resources: 2013 Survey*, London.
• **online sources** [in square brackets, indicate when website was last accessed]
  www.manpowergroup.com [accessed May 28, 2015]

Artwork and graphics
• editable, in black and white only, with no shading
• drawings, graphs and diagrams must be supplied in their native electronic formats (*.xls or *.cdr)
• photographs – supply source files (preferably *.tif); minimum resolution: 300 dpi
• number all graphical components consecutively using Arabic numerals
• for any artwork that has already been published elsewhere, indicate original source (or otherwise state *Source: own*)
• apply no lettering in white against black background, whether in bold or italics, and no black fills or excess frames
• if figure is referenced in the text, use its number rather than expressions such as "above" or "below" (e.g. *cf. Fig. 1*, not: *see figure above/below*)
• provide explanation of any abbreviations used

Tables
• numbered consecutively and consistently using Arabic numerals
• including caption and reference to data source (e.g. *Author's own research*)
• use its number to refer to table in the text rather than expressions such as "above" or "below" (e.g. *cf. Table 1*, not: *see table above/below*)
• with no blank cells
• any abbreviations used must be expanded below table

Mathematical formulas
• processed using Microsoft Equation 3.0
• special attention should be given to correct placement of any sub- or super-scripts
• variables – in *italics*; numbers and digits – in normal font style
• use "·" or "×" only as the multiplication sign (rather than e.g. asterisk or letter X)
• quantities should be represented in SI units only
• any symbols must explained below formula

Wymogi edytorskie Wydawnictwa WSB w Poznaniu dla autorów

Tekst
- kompletny, 1 wydruk oraz plik (*.doc lub *.rtf)
- pozbawiony fragmentów pozwalających zidentyfikować autora, np. *Jak wskazałem w pracy...* należy zastąpić formą bezosobową: *Jak wskazano w pracy...*

Układ tekstu
- imię i nazwisko autora, stopień/tytuł naukowy
- afiliacja
- telefon, e-mail, adres
- tytuł artykułu po polsku i angielsku
- streszczenie po polsku i angielsku (do 1000 znaków ze spacjami)
- słowa kluczowe po polsku i angielsku (do 8 słów)
- wstęp
- tekst główny podzielony na rozdziały opatrzone tytułami
- zakończenie (wnioski)
- bibliografia

Objętość – do 1 arkusza wydawniczego wraz z rysunkami i tabelami (ok. 22 stron)

Marginesy – 2,5 cm z każdej strony

Numeracja stron – ciągła, u dołu strony

Tekst główny
- czcionka Times New Roman z polskimi znakami, 12 pkt
- odstęp między wierszami – 1,5 pkt
- wyróżnienia – pismem półgrubym
- słowa obcojęzyczne – kursywą
- nazwiska użyte po raz pierwszy – pełne imię i nazwisko, kolejne przywołanie – samo nazwisko
- skróty – za pierwszym razem pełny termin, a skrót w nawiasie; dalej – tylko skrót, np. *jednostki samorządu terytorialnego (JST)*
- liczby do 4 cyfr – bez spacji i kropek (5000, a nie: 5.000 czy 5 000), liczby powyżej 5 cyfr – ze spacjami co 3 cyfry, licząc od prawej (5 000 000, a nie: 5.000.000)
- w liczbach dziesiętnych – przecinek, nie kropka (z wyjątkiem tekstów angielskich)

Przypisy bibliograficzne
- umieszczone w tekście w nawiasach kwadratowych: nazwisko autora/redaktora, rok, strony:
  [Meyer 2010: 31-40] lub [Dubisz (red.) 2003: t. 3, 104]
- jeśli autorów jest więcej niż trzech, należy podać tylko nazwisko pierwszego z nich, a po nim: i in.:
  [Kaczmarek i in. 2005: 56-67]
- jeśli brak nazwiska autora/redaktora, należy podać kilka pierwszych słów tytułu książki/dokumentu:
  [Zmiana studium uwarunkowań 2008]
- jeśli przywoływane są raporty, analizy itp., to należy podać nazwę instytucji i rok:
  [Eurostat 2014] lub: [GUS 2015]
- w przypisie można zawrzeć dodatkowe informacje, np.:
  [por. Hadzik 2009: 38] lub: [cyt. za Szromek 2010: 52]
- jeśli odwołanie dotyczy więcej niż jednej publikacji, należy je wymienić w kolejności chronologicznej:
  [Mansfeld 1987: 101-123; Jagusiewicz 2001: 40-73; Meyer 2010: 89-101]
- jeśli autor wydał w danym roku więcej niż jedną publikację, to po dacie należy dodać kolejne litery alfabetu, np.
  [Nowak 2014a, 2014b]

Przypisy objaśniające, polemiczne, uzupełniające tekst główny oraz **przywołujące akty prawne, wyroki i orzeczenia sądów i adresy stron WWW** – numerowane kolejno i **umieszczone u dołu strony**, czcionka 10 pkt, interlinia pojedyncza.

Bibliografia
- pozbawiona numeracji
- uporządkowana alfabetycznie według nazwisk autorów/ redaktorów i tytułów prac niemających autora/redaktora, a jeśli jest więcej prac jednego autora, to należy je zestawić chronologicznie wg dat wydania
- **artykuł w czasopiśmie** – nazwisko autora, inicjał imienia, rok, tytuł artykułu (prosto), *tytuł czasopisma* (kursywą), nr czasopisma, zakres stron:
  Borek M., 2000, Rola technik sekurytyzacyjnych, *Bank*, nr 12: 53-55.
- **pozycja książkowa** – nazwisko autora/redaktora, inicjał imienia, tytuł książki (*kursywą*), miejsce wydania: wydawnictwo:
  Janowska Z., 2002, *Zarządzanie zasobami ludzkimi*, Warszawa: PWE.
- **rozdział pracy zbiorowej** – nazwisko autora rozdziału, inicjał imienia, rok, tytuł rozdziału (prosto), w:, inicjał imienia, nazwisko redaktora + (red.), *tytuł pracy zbiorowej* (kursywą), miejsce wydania: wydawnictwo, zakres stron:
  Michalewicz A., 2001, Systemy informacyjne wspomagające logistykę dystrybucji, w: K. Rutkowski (red.), *Logistyka dystrybucji*, Warszawa: Difin, 102-123.
- **akt prawny**
  Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym, t.j. Dz.U. 2001, nr 142, poz. 1591.
  Ustawa z dnia 19 listopada 1999 r. Prawo działalności gospodarczej, Dz.U. nr 101, poz. 1178 z późn. zm.
  Dyrektywa Rady 2004/67/WE z dnia 26 kwietnia 2004 r. dotycząca środków zapewniających bezpieczeństwo dostaw gazu ziemnego, Dz. Urz. UE L 127 z 29.04.2004.
- **raporty, analizy**
  GUS, 2015, *Pomorskie w liczbach 2014*, Gdańsk.
- **źródło z Internetu** (w nawiasie pełna data korzystania ze strony WWW):
  www.manpowergroup.com [dostęp: 28.05.2015].

Ilustracje
- edytowalne, wyłącznie czarno-białe,
- rysunki, wykresy i schematy – w plikach źródłowych (*.xls lub *.cdr)
- zdjęcia – w plikach źródłowych (najlepiej *.tif), rozdzielczość min. 300 dpi
- opatrzone numerem oraz źródłem (np. *opracowanie własne*)
- pozbawione napisów: półgrubych, wersalikami, białych na czarnym tle, czarnych wypełnień, dodatkowych ramek
- z odwołaniem w tekście (np. *zob. rys. 1*, a nie: *zob. rysunek poniżej/powyżej*)
- z objaśnieniem użytych skrótów

Tabele
- ponumerowane, opatrzone tytułem oraz źródłem (np. opracowanie własne)
- z odwołaniem w tekście (np. *zob. tab. 1*, a nie: *zob. tabela poniżej/powyżej*)
- każda rubryka wypełniona treścią
- skróty użyte w tabeli – objaśnione pod nią

Wzory matematyczne
- przygotowane w programie Microsoft Equation 3.0
- poprawnie zapisane potęgi i indeksy
- zmienne – kursywą, liczby i cyfry – pismem prostym
- znak mnożenia to: · lub × (nie gwiazdka czy „iks")
- pisownia jednostek – według układu SI
- symbole objaśnione pod wzorem