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Heuristic Method for Successful Learning in Education for Sustainable Development

Summary. The economic and social transformations that have taken place in the Republic of Belarus in recent decades have led to a change in the state educational paradigm towards the priority of personal development and self-realization of students. The transition to new socio-economic relations emphasizes the task of developing abilities to overcome emerging problems, to offer non-standard solutions. There is an urgent need to develop creative abilities of the future specialist. The problem of freedom of choice and the possibility of making independent decisions in conditions of social change are becoming significant. In this regard, innovations in the educational activities of the Yanka Kupala State University of Grodno are aimed at changing the personal attitude, the implementation of decisions, and the position of responsible and independent decision-making of future specialists. One of the methods that ensures the activity of students in the process of employment, as well as their independent thinking, is the heuristic method of teaching.

Keywords: heuristic, heuristic dialogue, communicative competence, Education for Sustainable Development (ESD)

1. Introduction

Indeed, education is one of the world's most important human rights. But education is a prerequisite for achieving sustainable development and an essential tool for good governance, informed decision-making and the promotion of democra-

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cy also. Today it is recognized that the education system needs to be strengthened by sustainable development. This can be done by including a holistic approach in the educational curriculum from primary school right up to universities and graduate schools. Education for Sustainable Development can provide critical reflection and greater awareness and empowerment so that new visions and concepts can be explored and new methods and tools developed.

The task of modern education is the formation of the student's autonomy, his creativity, which guarantees the personality the possibility of self-education, intercultural interaction, and the development of professional competence. Also one of the most important tasks of education is to develop creativity, critical thinking, and an ability to communicate and cooperate.

Today, the strategy of sustainable innovation development of the world community demands not only the creation of favorable social and economic conditions, but also specific measures to form a new world outlook. For example, bringing up people who are able to perceive the present through the comprehension of the unity of the world and nature. With the global ecological crisis become increasingly serious, mankind has to admit its guilt on the one hand and on the other hand, has to look for a way to overcome it. It is clear that the system of ecological knowledge and behavior should reach, first of all, those who are responsible for the education of the future society, teachers.

Major changes have taken place in higher education in the Republic of Belarus recently. They are associated with the following trends: globalization of the educational space, change of the educational paradigm, Belarus joining the Bologna Process, large-scale introduction of information and communication technologies in the educational process of universities.

UNECE Strategy for education for sustainable development [2005] states that [article 41] "for ESD to become part of an agenda for change towards a more sustainable society, education itself must be subject to change. Research that might contribute to ESD should be encouraged. There is a need for increased cooperation and partnerships between stakeholders in research and development activities, ranging from identifying issues to working with new knowledge and making it known and used. The results of research and development efforts should be shared with actors locally, regionally and globally, and be incorporated into different parts of the education system, experience and practice."

2. Significance of teaching methods

Interest in strategies of learning has been renewed nowadays for several reasons. For example, society gives priority to students and directs strategies of teaching

and learning towards the development of his or her autonomy. This fundamental right of the student requires acquisition of cognitive methods and of methods of self-assessment, self-reflection and self-organization [Ellis & Sinclair 1989].

The analysis of theoretical literature has allowed us to conclude that the problem of the development of such a quality of personality of students of a pedagogical university has not been sufficiently studied. This makes it difficult to improve the development of this competence among students of a pedagogical university. Analysis of regulatory documents curricula, real educational practice in a pedagogical university, as well as a survey of students showed that the existing professional training of the future teacher is not sufficiently focused on the implementation the strategy of sustainable development. Above mentioned allowed us to say, that the process of teacher preparing should be aimed primarily at the development of their personal qualities. In this case, gaining knowledge by transferring the accumulated experience cannot be the purpose of learning.

3. Successful learning
for sustainable development

Educational and creative potential of young teachers in different countries of the world is formed under the influence of both the state and national traditions as well as through world integration and strategy of cooperation. A retrospective view of the history of the question reveals that a society realized the necessity to preserve the environment for life when a destruction of the biosphere by humans began to directly threaten the existence of the civilization. At the same time scientific understanding of the ties and unity of the biosphere does not mean a momentary change of the human consciousness with reference to the management of nature. Education for sustainable development involves knowledge, values and action competence. Students develop the capacity to act when they work with real and meaningful issues where they experience their work leading to change. The goal must be for students to acquire both the ability and the desire to act for sustainable development.

Education is one of the basic human right. Otherwise, as emphasize the Authors of Mediterranean Strategy on Education for Sustainable Development [2014] "is a prerequisite for achieving sustainable development and an essential tool for good governance, informed decision-making and the promotion of democracy." They indicate that education for sustainable development:

– strengthens the capacity of individuals, groups, communities, organizations and countries to make judgments and choices in favor of sustainable development;

– can promote a shift in people's mindsets and in so doing enable them to make our world better, safer, healthier, with more possibilities for employment and more prosperous, thereby improving the quality of life and equity among countries and generations;

– can provide critical reflection and greater awareness and empowerment so that new visions and concepts can be explored, and new methods and tools developed.

The potential of heuristic pedagogy as a strategy of education for sustainable development is very important. It is showed that modern social-cultural dynamics needs personalities with advanced level of internal mobility, flexibility and skills of self-transformation according to changeable social environment. It is demonstrated that heuristic pedagogy is focused on personality development of student [Arechavaleta & Navarro 2010: 351-364].

The study at university loses its meaning without active substantial communication with representatives of another academic environment and culture as a whole. Having no substantial communication, students do not change their knowledge, skills, competencies and the heuristic potential of personality doesn't increase. Also this strategy can organize qualitative interaction with another culture and develop students' world-views.

We want to review the principals underlying the construction of different types of models of teaching at the university using the method of heuristic dialogue and to show its role by applying it to the idea of sustainable development.

Heuristic learning is explained as learning, which aims to design students' own sense, goals and content of education, as well as the process of its organization, diagnosis and awareness. The method of heuristic learning has its own characteristics. In heuristic learning, educational material plays a very important role. It is used to create a student's own educational content in the form of his personal creativity products.

3.1. The school of heuristic dialogue in education

The most important element of heuristic education is the principle of personal goal-setting. Goal-setting takes place in the heuristic training through the whole process of education. It motivates the activities of students, structuring their learning process, allows you to clearly diagnose learning outcomes [Korol 2017: 88].

"Mastering the alien external and »correct« information does not change the person, and allows you to see the world through the eyes of a stranger. Monologist education system produces a Monologist Apprentice, seems to be a factory of stereotypes of thinking, communication, behavior" [Korol 2013b: 158].

"Socratic Dialogue is an ancient technique of engaging a student in a dialogue by asking non-leading questions, aimed at revealing to the student how much knowledge he or she already has on some topic. It derives its name from Socrates, Plato's teacher. His idea behind this was that one does not gain understanding by getting it 'dished up', but only by thinking for oneself" [Kessels 2009: 36]. It is important to note that Socratic Method's focuses on a combination of collective and individual learning.

"The Socratic dialogue is an attempt to come to a common answer through systematic deliberation about a fundamental question. It is not about merely theoretical questions. Rather it is about questions which derive from concrete experiences, accessible to all participants. The conversation in fact is a systematic reflection upon experiences. He tried to bring people to a deeper understanding by asking questions, by inquiring about examples and analyzing experiences" [Korol 2013a: 11].

"But in order to gain genuine knowledge certain abilities are required:

– The learner must be willing to be actively involved in the experience (sharing of one's story);

– The learner must be able to reflect on the experience (reflecting on the question at hand);

– The learner must possess and use analytical skills to conceptualize the experience (engaging in dialogue and good conversation or »philosophizing«);

– The learner must possess decision-making and problem solving skills in order to use the new ideas gained from the experience (developing a better understanding of how to voice one's moral concerns or confront moral muteness)" [Sims 2004].

We outline the Socratic Dialogue as a method of both researching and teaching creative thinking, and we reveal that the Socratic Method dovetails with this conception of co-creativity.

Kondrateva et al. [2016] formulated a hypothesis that "the effectiveness of the student as a person of culture in a multicultural education in non-language high school increases significantly under the following pedagogical conditions:

– the creation of a multicultural educational environment that encourages the development of various aspects of the personality of the student as a man of culture and contributing to the formation of his main qualities (humanism, tolerance, sociability);

– systematic, gradual mastery of the student's human values and moral qualities;

– organization of multicultural educational activities of students, aimed at overcoming all sorts of barriers to their development as human beings of culture by creating an atmosphere of creativity, implementation of complex training and educational tasks of multicultural orientation;

– accounting the laws of bilingualism;
– organization of training taking into account the principles of student-centered learning and the principles of the method of heuristic dialogue" [Kondrateva et al. 2016: 60].

"The recognition of the uniqueness of the individual and self-worth of each student resembles an original man who has his own predestined and genetically founded »program« of education, realized in the form of its individual trajectory in relation to general education. This postulate reflects one of the oldest ideas of human culture – everyone has their predestination and their mission" [Korol 2016: 159].

3.2. How to teach all students in different ways but similarly

Yanka Kupala State University of Grodno is the largest regional university in the Republic of Belarus. It is a center for scientific and innovation development of the Grodno region.

For more than 20 years Yanka Kupala State University of Grodno is actively involved in managing of international projects, has vast experience working within Tempus, Erasmus Mundus, EU Cross-Border Cooperation programs, etc.

YKSUG is a full member of the Baltic Sea Region University Network Partnership (BSRUN), European University Association (EAU), Eurasian Association of Universities (EAU), Baltic University Programme (BUP).

Yanka Kupala State University of Grodno carries out research activity such as: internationalization of higher education, Sustainable Development, ecology tourism, innovative activity, cultural and historical heritage, transport and logistics, etc.

The process of the evolution of higher education for sustainable development (ESD) in the Republic of Belarus is still ongoing. And Yanka Kupala State University of Grodno, like many other universities in Belarus, has made a commitment to include ESD in its post-2014 development agenda, after a decade of ESD implementation in Belarusian universities.

We will try to identify significant achievements, and the best ESD practices in the university.

According to UNESCO among the goals of Education for Sustainable Development are the following:

– to use the creative potential of the scientists and the teachers more efficiently;

– to work out and implement the educational programmes of retraining and professional upgrading for people working in educational institutions of different levels as well as programmes for social workers;

– to develop international partnership for consolidation of interaction and cooperation for sustainable development through common projects;

– to organize teaching staff exchange and student mobility (Khanty-Mansiysk, Russia, 2009).

"The National Strategy for Sustainable Socio-Economic Development of the Republic of Belarus by 2030 emphasizes the importance of sustainable development in educational processes. To secure the sustainable development in education, its principles need to be implemented in all training courses. Higher pedagogical education should provide training in designing and teaching such courses" [Gadzaova, Murauyova & Urban 2017: 75]. The main question is "What kind of pedagogical conditions are necessary for the development of the competence of students for sustainable development using the method of heuristic dialogue?" To find the answer we have analyzed the National Strategy and fixed out two important factors:

1. The availability of teaching staff to take part in this process and their ability:

– to use new educational technologies;

– to take part in cultural, social and educational activity of the University;

– to take part in the international project activity;

– to lead healthy lifestyle;

– to promote nature protection, love to home town, country etc.;

– to facilitate and encourage public awareness by making environmental information widely available.

2. To fulfill the goals of Education for Sustainable Development we need the second factor – students

– students must be ready not only to get knowledge, but to have active living position to achieve SD;

– together with the students and teachers education sector is a powerful force, a communication channel for disseminating knowledge and skills;

– educational institutions should incorporate the concepts of sustainability in all academic disciplines and should take the leadership for establishing a network with primary and secondary education [National Strategy... 2015].

At our university, training future school teachers to build their lessons in line with the principles of sustainable development covers three key areas. The first area relates to the development of pupils' social involvement through acquiring intellectual and practical skills. The second area concerns pupils' relationship with their natural and cultural environment. Future teachers are trained to design the lessons stimulating pupils' emotional engagement and caring attitude. The third area that future teaches are trained to target is pupils' economic and financial competence.

We recognize that he education system of the Grodno region needs to be strengthened by sustainable development. This can be done by the inclusion of

a holistic approach in the educational curriculum from primary school right up to universities and graduate schools. Education for Sustainable Development can provide critical reflection and greater awareness and empowerment so that new visions and concepts can be explored and new methods and tools developed.

This heuristic effective teaching is fundamental to all aspects of planning learning experiences and the practices of teaching. It is also the area in which much creativity can be generated and applied as it offers almost limitless possibilities in terms of how teachers can maximize attention and variation in the learning process.

The main components of heuristic education through dialogue focus on solving one of the fundamental problems of education today: how to overcome its monologue (reproduction) focus on the transfer of the student so-called "ready" knowledge. Innovative didactic training systems help to overcome the monologue of the existing education and ensure the transition to a qualitatively new level of student training.

The author of the system of heuristic learning based on dialogue is Andrei Karol, Rector of BSU, Doctor of Education, Professor. The author, based on his own fundamental methodological and theoretical quest over many years of testing in the educational process of school and higher education system, offers an original system and technology of heuristic learning through dialogue. The heuristic dialogue describes a situation where students pose questions at all stages of the educational activities (goal-setting, choice of means and methods, implementation of the objectives of reflection). Students' questions are the key methodological, methodical component and system simulation tool of heuristic learning through dialogue. The author also offers the methodology of interactive educational activity of the student, which finds its expression in three groups of methodological cognition of the objects ("What?," "How?," "Why?"). Interactive components of heuristic education model forms the basis for the interaction of personal and public education components. The author offers internal and external components of the heuristic-interactive tasks for the students.

4. Conclusion

Yanka Kupala State University of Grodno is the largest regional university in the Republic of Belarus. It is a center for scientific and innovation development of the Grodno region. The region is an exceptional eco-region because of its geographical and historical characteristics, its unique natural and cultural heritage. At the crossroads of three borders the region brings together countries and peoples of different levels of economic and social development, different religions, languages and cultures, that share, however, a common heritage, created throughout

centuries old 'exchanges' of all kinds. Given these characteristics, the Grodno region is a perfect illustration of the global situation.

Yanka Kupala State University of Grodno has a strong focus on sustainability in its research. The University is also working on pushing the sustainability agenda within teaching and learning. One of our strategic priorities is to explore ways in which we can embed sustainability into the academic curriculum and the experience of all our students. We have a three-pronged approach to this:

– using sustainable learning technology;
– developing discipline-related content about sustainability;
– developing and supporting sustainable methods of teaching and learning to develop sustainability literacy.

The Socratic method is one of the best ways to help guide the students through critical thinking in a way that is challenging and engaging.

Socratic dialogue, in our view, is a form of experiential learning and provides students with the opportunity of "learning by doing." The Socratic method design engages students in a dialogue in which they play an active role by sharing their stories and experiences and then reflecting about them, for example regarding voicing or not voicing their concerns.

The Socratic Method design proposed in this paper, like experiential learning, is effective as it involves students' reflecting on and sharing past and current experiences and making observations. Thus, our premise that Socratic Method provides a way for experiential learning to be incorporated in the process of learning in teaching efforts or "learning by doing."

It should be emphasized that, of course, heuristic learning cannot completely replace traditional learning, but it is advisable to use it as an organic complement to traditional learning technologies at the university.

References

Arechavaleta B.O., Navarro S.P., 2010, Heuristic reasoning and beliefs on immigration: an approach to an intercultural education programme, *Intercultural Education*, 21(4), 351-364.

Declaration of International Congress of UNESCO Chairs on Education for Sustainable Development, 2009, Khanty-Mansiysk, Russia.

Ellis G., Sinclair B., 1990, *Learning to Learn English. Learner's Book*, Cambridge: Cambridge University Press.

Gadzaova S., Murauyova G., Urban M., 2017, Preparation of Future Primary School Teachers to Implement Ideas of Sustainable Development in Maths Classes, *Studia Periegetica*, 1(17), 75-87.

Kessels J., 2009, The Socratic Dialogue as a Method of Organisational Learning, *Dialogue and Universalism*, 6, 5-6.

Kondrateva I.G., Madakina N.Y., Sigal N.G., Valeev, 2016, The development of the student as a person of culture in the context of multicultural education in non-language high school nu means of a foreign language, mathematics, *Education*, 11(1), 57-69.

Korol A., 2013a, Heuristic training as a means of individualization of education [Evristicheskoe obuchenie kak sredstvo individualizatsii obrazovaniia], *Narodnaia asveta*, 10, 10-13.

Korol A., 2013b, Stereotip kak obrazovatelnaya problema, *Voprosy filosofii*, 10, 156-162.

Korol A., 2016, „Quo vadis", pedagogics: on the rational and mystical way of acquiring the human, *Cuadernos de Rusística Española*, 12, 149-160.

Korol A., 2017, Heuristic lesson. Results, analysis, reflection (How to develop and conduct a heuristic lesson): a methodological guide, *Vjushjeshaja shkola*, 223.

Mediterranean Strategy on Education for Sustainable Development, 2014, https://ufmsecretariat.org/wp-content/uploads/2014/05/Mediterranean-Strategy-on-Education-for-sustainable-development-.pdf [access: 12.12.2016].

National Strategy for Sustainable Socio-economic Development of the Republic of Belarus until 2030 [Natsionalnaya strategia ustoychivogo sotsialno-economicheskogo razvitia Respubliki Belarus na period do 2030 goda], 2015, *Economic Bulletin of the Economic Research Institute of the Ministry of Economy of the Republic of Belarus*, 4(214), www.economy.gov.by/ru/macroeconomy/nacionalnaya-strategiya [access: 12.12.2016].

Sims R.R., 2004, Business Ethics Teaching: Using Conversational Learning to Build an Effective Classroom Learning Environment, *Journal of Business Ethics*, 49(2), 201-211.

UNECE Strategy for education for sustainable development, 2005, www.edu.ro/sites/default/files/Strategia%20UNECE%20pentru%20EDD_versiunea%20in%20lb.%20engleza.pdf [access: 12.12.2016].

Heurystyczna metoda jako wsparcie skutecznego uczenia się w ramach edukacji na rzecz zrównoważonego rozwoju

Streszczenie. Przemiany gospodarcze i społeczne, jakie nastąpiły na Białorusi w ciągu ostatnich dziesięcioleci, doprowadziły do zmiany państwowego paradygmatu w edukacji, która polega na wzmocnieniu roli rozwoju osobistego i samorealizacji studentów. Przejście do nowych stosunków społeczno-ekonomicznych wiąże się z koniecznością rozwoju umiejętności przezwyciężania pojawiających się problemów i poszukiwania niestandardowych rozwiązań. Pojawia się zatem potrzeba rozwijania zdolności twórczych przyszłych specjalistów. Coraz większego znaczenia nabiera problem wolności wyboru i możliwość podejmowania samodzielnych decyzji w warunkach zachodzących zmian społecznych. W związku z tym innowacje w działalności edukacyjnej Grodzieńskiego Uniwersytetu Państwowego im. Janki Kupały mają na celu zmianę osobistej postawy, kształcenie umiejętności odpowiedzialnego i niezależnego podejmowania decyzji przez przyszłych specjalistów. Jedną z metod zwiększających aktywność studentów w procesie edukacji i prowadzących do niezależności intelektualnej jest heurystyczna metoda nauczania.

Słowa kluczowe: heurystyka, dialog heurystyczny, kompetencja komunikacyjna, edukacja na rzecz zrównoważonego rozwoju