ON THE PROBLEM BASED LEARNING AS A AGENT OF SUSTAINABLE DEVELOPMENT IN HIGHER EDUCATION

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Abstract
The article analyzes on the problem based learning in the aspect of sustainable development in higher education. on the problem based learning is presented as the idea of sustainable development agent of higher education that could be used in higher school or national level after its application context assessment and its modification. Understanding on the problem based learning as a learning strategy as a whole it may be naturally related to sustainable development. Correlation of these two factors can become the agent of sustainable development implementation in higher education.

KEYWORDS: on the problem based learning, sustainable development, the strategy of learning.

Introduction
Strategic documents of Lithuania (Regulations of National Education Strategies for year 2003–2012, 2003; National Sustainable Development Strategy, 2003; Program of National Education for Sustainable Development for year 2007–2015, 2005, and others) have influenced the development of Lithuanian higher education. Furthermore, strategic guides of the European Union (Learning from each other: The UNECE Strategy for Education for Sustainable Development, 2009; UNECE Strategy for Education for Sustainable Development, 2005, etc.), has influenced it too, and which should be evaluated in terms of Lithuanian higher education development efficiency, taking into account the context of Lithuania. One of such EU guidance document could be “Learning from each other: The UNECE Strategy for Education for Sustainable Development” (2009). Jamey indicated that “education is a key agent for change towards sustainable development. Sustainable development education builds the ability for individuals, communities and society, as a whole, to make informed judgments and choices in favor of sustainable development” (iii, 1). Indeed, all the operating Lithuanian higher education institutions should assess the sustainable development perspective because high schools acting in society are becoming the agents of sustainable development. In addition, as noted in 74 position of National Sustainable Development Strategy (2003): there is a development of an intense dialogue between business and science; centres and networks of competence are created, clusters (inter-related and mutually supporting one each other (enterprises), the national technology platforms, prepared integrated Science, Studies, and Business Centres (valleys) visions of development. Proper attention administered for education – the nation has decided to increase investments in science, education and innovations. A significant part of the EU structural funds have been allocated for needs of education, science, studies and innovation. “Processes taking place in Lithuania encourage higher institutions to engage in implementation of sustainable development ideas. The question remains: how this can be implemented?” One possibility could be to select on the problem based learning as learning strategy in higher education – this would promote various fields of study to address the encountered problems, which are essentially an integral part of sustainable development.

Of course, sustainable development issues in higher education are not new, it is researched by Lithuanian and foreign researches: the analysis of sustainable development observes that „the main problem is a gap between economic and social development“ (Šveikauskas V. Kirilova L., 2007, pg. 1), R. Bruzgelevičienė (2006) highlighted the ideas of sustainable development and correlations of Lithuanian education reforms; L.Galkutė (2011) emphasized problems of ,,sustainable development paradigm as a conceptual framework for qualitative assessment of higher education“; M. Barth, J. Godemann, M. Rieckmann, U. Stoltenberg (2007) examines the impact of formal and informal education on development impact of developing key competencies within higher education; P. Albrecht, S. Burandt, St. Schaltegger (2007) researched as sustainable development projects can stimulate organizational learning at universities; P. Blaze Corcoran, W. Calder and R. M. Clugston (2002) address the attention to the concept of sustainable development and the importance of higher education perspectives, etc..

On the problem based learning (problem - based learning) in higher education (“on the problem based learning” (PBL)) is not a new issue. It’s been examined in terms of conception, implementation,

The new concept of this article is on the problem based learning represented as an agent of sustainable development in higher education.

**Aim** – to highlight on the problem based learning in higher education as sustainable development agent.

**Object** – on the problem based learning in higher education in sustainable development perspective.

**Methodology:** analysis and modeling of scientific literature and documents.

Theoretically this article is significant because practice of on the problem based learning is represented as the idea of an agent of sustainable development in higher education, practically it is significant because it could be used in higher school or national level after its application context assessment and its modification.

**On the problem based learning.** On the problem based learning is defined in different ways. Some emphasize the process more “problem-based Learning is part of the shift from the teaching paradigm to the learning” (Barr. R. J., Tagg., 1995). H. Barows refers to the dimension of outcome: “the learning that results from the process of working towards the understanding of a resolution of a problem. The problem is encountered first in the learning process” (Barrows H., 1989). T. Barett (2005) in opinion “problem-based learning as a total education strategy”, but operational definition of PBL can be analyzed in six approaches (Figure 1).

1) First students are presented with a problem.

2) Students discuss the problem in a small group PBL tutorial. They clarify the facts of the case. They define what the problem is. They brainstorm ideas based on the prior knowledge. They identify what they need to learn to work on the problem, what they do not know (learning issues). They reason through the problem. They specify an action plan for working on the problem.

3) Students engage in independent study on their learning issues outside the tutorial. This can include: library, databases, the web, resource people and observations.

4) They come back to the PBL tutorial(s) sharing information, peer teaching and working together on the problem.

5) They present their solution to the problem.

6) They review what they have learned from working on the problem. All who participated in the process engage in self, peer and tutor review of the PBL process and reflections on each person’s contribution to that process.

**Figure 1:** Operational definition of PBL (Barret T., 2005, pg.15)

Each position of the six author’s operational definitions of PBL is also useful in perspective of implementation of the sustainable development idea. When students are presented with a problem, it should be presented in conjunction with sustainable development because in any case they are related. Later in small group discussions defining the problem, they should analyze it together with the whole context that is related to sustainable development. In the third position, students should look for the answer to the problem in libraries, databases, and etc.. Since the first two positions have been linked to sustainable development, students here have the specific problem and in one way or another they should look for solutions, and when they will meet the author they will be able to discuss about sustainable development in any perspective. In the problem solution, it also will be emphasized in one way or another. This highlight will remain in sixth position. Thus, in T. Barrett (2005) Operational definition of PBL every position can be smoothly related to sustainable development that is extremely important in every field of study. In this way students will learn their way of thinking and the whole activity will be associated with today’s topical issue – sustainable development. It will also become a complex part of their professional activity. Taking in account problem-based learning as an education strategy, it should be reflected.
Every Problem-based Learning as a Total Education for complex part: curriculum design, PBL compatible assessments, philosophical principles, PBL tutorials should be related to sustainable development. Finally, there is the need carefully study each of the above mentioned characteristics and they should look for opportunities to relate them with Sustainable Development (Barrett T., 2005, pg. 15 − 21).

In this context, the attention should be drawn to the document: “Learning from each other: The UNECE Strategy for Education Sustainable Development” (2009, pg. 77) in diagram (Figure 3).
Self-assessment in implementing the UNECE Strategy for ESD can be modeled in the result. It is obvious, that each of these elements is encoded in the context of the impact of higher education – ESD should be assessed in two-fold balanced approach. Trying to eliminate the tension between those who’re thinking that ESD changes behavior (instrumental view) and those who’re thinking that it is a more learner-centered process (the emancipator view). In particular, attention is drawn to the fact that these two represented forms must be in cohesion “These two forms can be seen as complementary sides of the same “ESD coin”. Even though we deliver a strong ESD 1-style program of pro-environmental learning, ESD 2 has few chances of being taken to participate. Furthermore, Vare and Scott (2008) 10 have broaden this disagreement offering there is no possibility to take out of the context ESD 1 or ESD 2” (in the same work, 2009, pg. 81). The remark from the document referred should also be assessed “Achieving a balance between ESD 1 and 2 is important.

ESD 1 is crucial for future development, but applying ESD 1 too often, society could become even more untenable, firstly because they would always need to be told what to do next or because they become skilled at knowing how to resist the experts’ inspirations. Furthermore, ESD 2 may be useful to us by learning how to carry on and succeed in the future, however Hile ESD 2 also may make us to be tough, self-assured, actually, the possibilities are not very useful to release a critical knowledge of sustainability issues.

Finding a balanced approach in education to sustainable development could become one of the problems that may be studied in various study programs. Students would form the idea of sustainable development and its principal values and perhaps in future it may become a challenge and opportunity for their career to be based on the principles of sustainable development.

However, in this case too much theoretical and often individual closely not related teaching disciplines should be abandoned in higher education practice because “Education should keep its long-established accents on separate issues and simultaneously leave the window open to multi- and inter-disciplinary investigations of real-life moments. This would insist pedagogues to reconsider their role of being only transmitters and their learners being only recipients. The impact should reform the structure of learning programs and should reinforce pedagogues and learners to become the team” (United Nations, 2005, pg. 1). In order this idea would be implemented, there is possibility to use on the problem based learning because understanding on the problem based learning as a learning strategy, each of its elements (curriculum design, PBL compatible assessments, philosophical principles, PBL tutorials) and the strategy itself could be naturally linked as a whole to sustainable development.

For this purpose, the sustainable development should be modeled using on the problem based learning as a scheme of learning strategy to be implemented in Lithuanian higher education and consisting of seven steps.

Sustainable development through on the problem based learning as a learning strategy to be implemented in Lithuanian higher education may be defined by seven steps of the scheme:

1. To analyze usability of on the problem based learning and sustainable development.
2. To describe relationship between on the problem based learning and sustainable development.
3. To develop model of on the problem based learning and sustainable development.
4. To indentify realization opportunities and risks of problematical learning and sustainable development model.
5. To implement model of problematical learning and sustainable development.
6. To reflect the problems and opportunities for improvement of on the problem based learning and sustainable development model.
7. To improve the model of on the problem based learning and sustainable development.

Every step of this model is coherent with one another and it should be considered as a whole in conjunction with on the problem based learning and sustainable development. Each study program should model it and take into account its specifications (objectives, content, etc.).

Conclusion

1. Sustainable development is an important factor for the country, community, individual and the whole world in trying to achieve harmonization of nature and human activity. In order to understand it and implement in professional and everyday lives activities of individuals and groups of people, the higher education plays significant role because it not only prepares professionals, but also its scientific researches and results can and should affect the implementation of sustainable development.
2. On the problem based learning and sustainable development are coherent with formulation of problems and in searching their solutions and it may become an agent of sustainable development implementation in higher education. For this purpose, Problem-based Learning should be properly modeled as a Total Education Strategy and its component parts: curriculum design, Problem-based Learning compatible assessments, philosophical principles, Problem-based Learning tutorials, in searching coherence between on the problem based learning and sustainable development.

3. Linkage between sustainable development and Problem-based Learning can be implemented based on sustainable development using on the problem based learning as a learning strategy, to be implemented in Lithuanian higher education as scheme of seven steps.

For this purpose, it would be appropriate to analyze feasibility and interference of this model in every higher education school, as well as to highlight this model’s advantages and opportunities for improvement in achieving efficiency of its implementation.

**Literature**


**PROBLEMINIS MOKYMAS KAIP DARNAUS VYSTOMOSI AUKŠTAJAME MOKSLE AGENTAS**

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**Santrauka**

Straišnynė nagrinėjamas probleminis mokymasis aukštojo mokslo darnaus vystymosi aspektu. Probleminis mokymasis pateikiamas kaip aukštojo mokslo darniaus plėtros agento idėja, kuri gali būti panaudota auksčiosios mokyklos ar nacionaliniu lygmeniu, įvertinus jos taikymo kontekstą ir ją modifikuvas. Probleminį mokymą analizuojant kaip mokymosi strategiją, jį holistiniu aspektu galima natūraliai sieti su darniu vystymuisi. Šių dviejų elementų sąsają gali tapti darnaus vystymosi igyvendinimo agentu aukštajame moksle.