

MINING NEAR AN URBANIZED AREA – PROJECT BASED TRAINING

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Keywords: project-based learning, interdisciplinary learning, ecology

Abstract: Project-based learning at school is necessary because students work much more successfully outside of the classroom hours. The freedom of the student and the actuality of the problem give a sense of importance and the benefit of the effort. Human activity has a very significant impact on nature and this fact is the reason why measures are required for the rational use of natural resources. Unfortunately, in many cases economic interest plays a leading role.

This is the case that we have chosen to explore and realise at school through a debate on topic "For and Against mining in the near urban area- project-based learning. In block hours (2 hours) students will participate in a debate. They are pre-divided into three groups: Group 1- protect the economic interest of the Russian federation from mining (diamonds). Group 2- protect the economic interest of the population (providing jobs), but also the interest of the population in terms of how this activity affects the quality of life in this area. Group 3- environmentalists - protect the interest of nature.

Students have two weeks to research all the details, to form an opinion, to prepare their arguments, to suggest the arguments of their opponents and to rebut them, to develop strategies.

CHARACTERISTICS OF THE PROJECT-BASED TRAINING

For a long time students have been asking the question: "Why do I need to know ...?" Often, students do not see the point of getting acquainted in detail with a particular process, phenomenon or concept. They are not always able to find the application of everything they learn, and this creates a sense of waste of time and effort. Unfortunately, the limited number of hours and the large amount of information make science difficult to understand. All this is a prerequisite for demotivation of the student. In this regard, project-based learning is a very good

opportunity to study a topic or problem in depth through an interesting approach to young people, which makes them active because they want to, not because they have to.

A priority in the education of young people in each country should be its orientation towards the young people themselves, in order to develop their abilities and skills that underlie their future professional responsibilities. At the heart of the educational structure is a personal approach, combined with reflection, which will best help the individual student achieve personal, social and professional realization, which is in fact the ultimate goal of education. Mastering the knowledge and skills that underpin competencies, as well as attitudes, relationships, and interests determine the student's intellectual profile at the end of each degree. Environmental education standards and curricula ensure the necessary unity in the planning, organization and management of environmental education in the system. They should be a "sign" of the state's responsibilities regarding the quality of environmental education in Bulgaria. Standards should also be a tool for students' expected achievement at the end of the educational stage. In this context, criteria should be developed to assess the state of the system in terms of students' environmental education. A unified conceptual framework for defining the structure and scope of environmental content in textbooks for different subjects and at different stages and grades has been developed (Yotovska and Necheva, 2019).

There is a change in the roles of students and teachers in the PBL process. Students play the role of individuals who actively solve problems. They are responsible for their learning, motivated and with a sense of satisfaction from completing something useful, become active participants and creators of meaning (Shin, 2018; Setiawan, 2019; Wijayati et al., 2019;) The teacher as a coach / manager manages group dynamics, supports the advancement of the process, advises and evaluates, helps to improve interpersonal relationships (Yotovska and Asenova, 2012). In other words, how does a lake without water go to dryness? Thanks to Geography (6th grade) and Biology (7th grade), this environmental problem of early learning is posed by the students. The interdisciplinary nature of project-based learning offers special aspects to students who may not have been able to attend non-traditional classroom hours. In addition, this drives students to do extra work (Vogleret al., 2018). The model we built (Table 1) aims not only to apply in extracurricular activities, but also in real time in geography and biology (Yotovska et al., 2010, Yotovska and Asenova, 2011).

EXPECTED RESULTS

The ability to speak in front of an audience, to work successfully in a team, to develop leadership skills, to plan, to organize their time and that of others is of great importance for the growth of our students. Project-based training is

about exploring, discovering cross-curricular relationships with other sciences, analyzing and summarizing results, presenting and defending those results, and finally produces a product, reminiscent of experiences, obstacles overcome and many great emotions.

ACTIVITY

- * Human activity has a very significant impact on nature, and this is the reason why measures for the rational use of natural resources are required.
- * Unfortunately, economic interest plays a leading role in many cases.
- * This is the case we have chosen to study and implement at school through a debate on "For and Against Mining in the Near Urban Area - Project-Based Training" in Grade 10 - Environmental Case Studies - Exercise.
- * Students in one grade 10 class completed an anonymous survey with the following questions:

- What is sustainable development for you?
- Can you offer an economic benefit from a global environmental problem?

Justify yourself.

- In your opinion, through sustainable development of the city / region, is it possible to increase the population?

The analysis of the survey shows that the students in the masses do not know what sustainable development is (Fig. 1) 10 students have not answered anything, 9 - I do not know, only 7 students have acceptable answers;

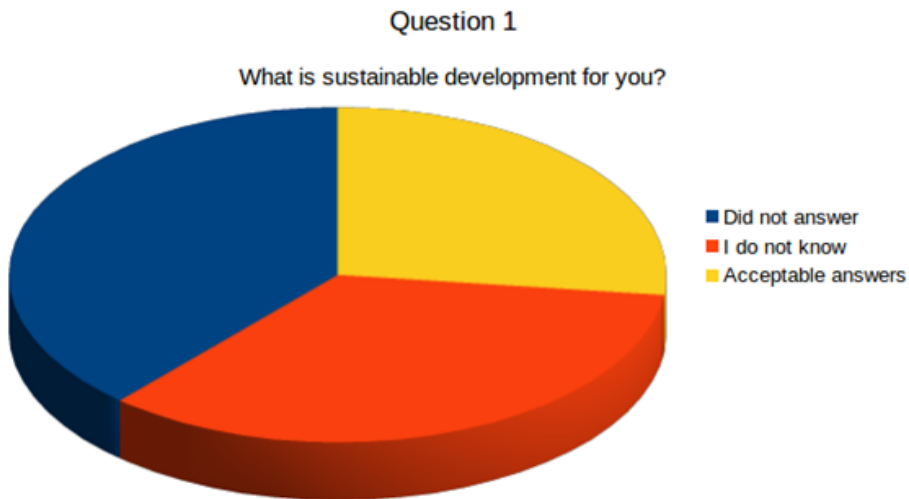


Fig. 1 Number of students answered the question:
What is sustainable development for you?

To the question: Can you offer an economic benefit from a global environmental problem? Justify yourself.

Here, only two did not respond, and two responded, "I don't know," the other 22 students wrote suggestions and justified themselves (Fig. 2) The students are always looking for some material expression to support their efforts, and that is why their strength is revealed here.

Question 2

Can you offer an economic benefit from a global environmental problem? Justify yourself.

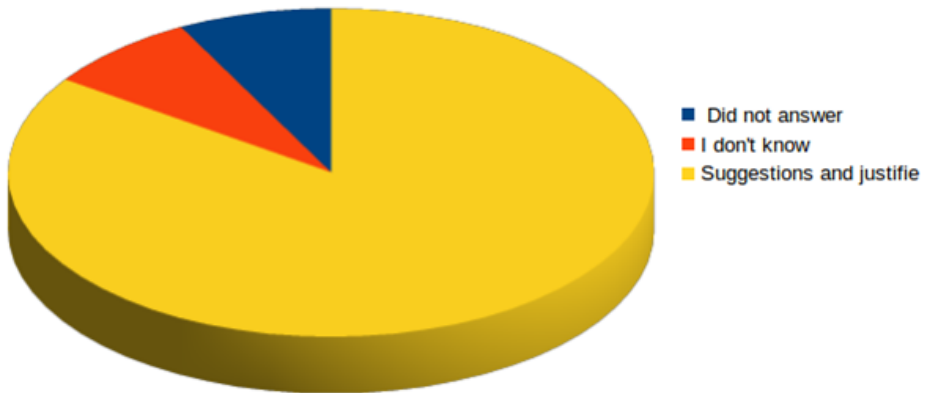


Fig. 2 Number of students answered the question: Can you offer an economic benefit from a global environmental problem? Justify yourself.

To the question: In your opinion, through sustainable development of the city / region, is it possible to increase population?

Number of students who did not answer - 5; I don't know - 4; No - 2; Yes - 4; Reasoned answers – 11 (Fig.3).

Question 3

In your opinion, through sustainable development of the city / region, is it possible to increase the population?

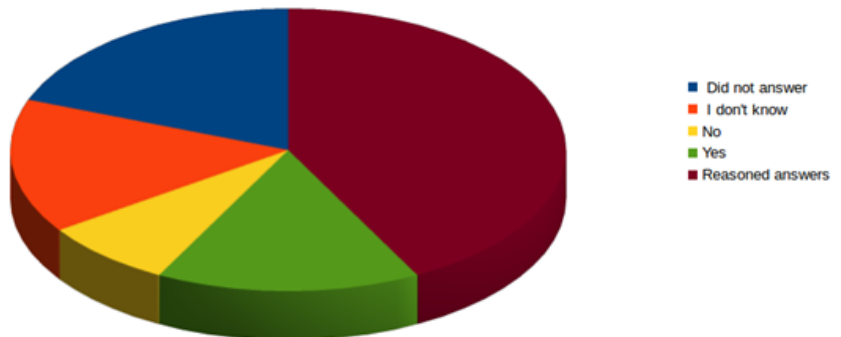


Fig. 3 Number of students answered the question: In your opinion, through sustainable development of the city / region, is it possible to increase the population?

The results of the survey showed that it is not clear to the students what sustainable development means, but they would be successful in finding a solution in a particular situation. We decided to use this strength: We divided the students into 3 groups with different functions (described above). They had two weeks to study all the details; to form an opinion; to prepare their arguments; suggest their opponents' arguments and rebut them; to develop strategies.

At this preparatory stage, the students rediscover themselves, even creating a lasting friendship; discover their strengths and weaknesses; develop teamwork skills and valuable qualities that will make them better and more successful people; learn to make strategies; together they overcome difficulties and most importantly the students have fun together.

Reasons why students did not respond

The first reason students may not have answered the questions is because they are not familiar with the topic. They may also not be focused. Students may have no opinion on the topic. The fourth reason they did not respond was the lack of interest in the topic provided.

CONCLUSION

Project-based training includes a specific design and philosophy of the learning process. It is related to the organization of a purposeful activity of the student, in accordance with his / her personal needs and interests. It is based on the idea of leading the educational and cognitive activities of students in the process of obtaining results in solving practically and theoretically important problems. (Yotovska and Necheva, 2018). The attitude towards the natural environment becomes more and more conscious and responsible, depending on the level of our knowledge about it (Yotovska and Necheva, 2019). Therefore, environmental education must start from a young age and must be developed throughout the learning process. Students' attitudes towards environmental protection begin with the realization that, above all, man is responsible for everything happenings in nature. The theme also proved a global problem. Therefore, environmental education and school education in the environmental field must be done very carefully and responsibly, because we all depend on the future of our common home - Planet Earth.

DECLARATION OF INTEREST

The authors declare no existing conflict of interest.

AUTHOR CONTRIBUTION STATEMENT

NK and HV designed the experiment. NK and HV analyzed the results and wrote the manuscript.

REFERENCES

1. Asenova A. , Yotovska K. (2011). Kluchovite kompetencii na uchitelya po biologiya v konteksta na elektronnoto obuchenie [Key competences of the teacher in Biology in the context of electronic learning] Ed. D. Ubenova (in Bulgarian)
2. Blumberg, P. (2019). Designing for Effective Group Process in PBL Using a Learner-Centered Teaching Approach. *The Wiley Handbook of Problem-Based Learning*, 343-365.
3. Shin, M. H. (2018). Effects of Project-based Learning on Students' Motivation and Self-efficacy. *English Teaching*, 73(1).
4. Setiawan, A. R. (2019). A brief explanation of scientific teaching.
5. Vogler, J. S., Thompson, P., Davis, D. W., Mayfield, B. E., Finley, P. M., & Yasseri, D. (2018). The hard work of soft skills: augmenting the project-based learning experience with interdisciplinary teamwork. *Instructional Science*, 46(3), 457-488.
6. Wijayati, N., Sumarni, W., & Supanti, S. (2019). Improving student creative thinking skills through project based learning. *KnE Social Sciences*, 408-421.
7. Yotovska K., Asenova, A. Popova, K. (2010). Project Based Education as an impact factor regarding the motivation of the students. 6-th International Scientific Conference, Dedicated to the International Earth Day, 16 – 17 April 2010, Sofia, 211-214.
8. Yotovska K., Necheva V. (2019). National standarts and curricula – analysis regarding ecological knowledge, skils, attitudes and values, International Seminar of Ecology - 2019, IBER, BAS, 80-90.
9. Yotovska K., Necheva V. (2018). Successful implementation of project-based learning in higher education: An example from ecology, Seminar of Ecology with international participation, IBER, BAS, 212-218.