



Theme: "Sustainable Environmental Protection & Waste Management Responsibility"

November 19 – 20, 2020 RKK – Óbuda University, Budapest, Hungary

ISBN: 978-963-449-203-0

www.iceee.hu

PROJECT EDUCATION IS A STRATEGY OF PROJECT PEDAGOGY

Rita Bodáné-Kendrovics

Environmental Engineering and Nature Sciences Institute of Rejtő Sándor Faculty of Light Industry and Environmental Engineering, Óbuda University, Hungary
bodane.rita@rkk.uni-obuda.hu

Abstract: *The new strategy of higher education - Graduation in Higher Education, Guidelines for the Development of Performance-Based Higher Education - expects a higher proportion of practice-oriented education in engineering education, as it provides the basis for the development of professional competencies. This includes in particular the co-emergence of knowledge, skills, attitudes and the ability to take responsibility. The competency development of students majoring in environmental engineering s need to be supported by field work and practical activities based on examples taken from the real life problems and the solutions. Practice-oriented education promotes the development of internal, self-regulatory motivation, which is necessary for the further acquisition of knowledge in an individual way, for the development of ability of lifelong learning. By providing an opportunity to expand the teaching-learning space and considering fieldwork as an integral part of the training, project education creates the conditions for competence-based training, contributes to the development of responsible, environmentally conscious behaviour towards the environment, as well as the system approach that is essential for engineering activities.*

Keywords: *project education, environmental attitude, field work, systems approach*

INTRODUCTION

The modification of the training and output requirements for the basic training of environmental engineers already takes into account and emphasizes the implementation of competence-based training at several points. In this, special emphasis is given to interoperability – graduate “can cooperate with social organizations dealing with environmental protection, but ready to debate in order to develop optimal solutions. Open to professional cooperation with specialists working in other fields related to their profession. Strives to solve tasks and makes management decisions by getting to know the opinions of employees, preferably in cooperation. Shares experiences with the staff, helping them to grow”, self-education - “Strives to continuously improve knowledge through self-education and to keep knowledge up to date about the world. By participating in organized trainings he/she continuously develops his/her knowledge in the field of environmental protection” - and about responsibility for the environment: „undertakes and authentically represents the social role of environmental protection and, its fundamental relationship with the world; responsibly professes and represents the values of the engineering profession, openly accepts professionally grounded critical remarks ” [1]

In addition to teaching scientific theoretical knowledge, the task to be solved in the education is to develop system approach, problem recognition and solution, ability of lifelong learning and responsibility for the environment. Recognizing and solving global and regional environmental problems cannot be without technical intelligence with a high level of scientific knowledge and responsible behavior towards the environment. “Environmental protection is especially a profession that can only be performed with solid

professional knowledge, scientific readiness and ethical engineering thinking. Environmental education is based on the respect and responsibility we feel for human life, the natural environment and the domestic 'gray stock' of knowledge as the best values". [2]

The pedagogical methods used in higher education must be chosen and renewed in accordance with this goal. Education, which is primarily based on the method of lecture, should be replaced by practice-oriented pedagogical methods, one of the methods of which has been proven to be effective for decades, the project method.

PROJECT EDUCATION IS THE LEARNING TO LEAR

"Project education is a problem-oriented open education strategy" [3], in which the activity-oriented, task-oriented organizational forms and methods are appeared. Its aim is to guide the student from the formulation of the problem to its solution through a teaching-learning process, the end product of which proves the understanding of the contexts and development of the problem-solving ability. In addition to all this, it provides an opportunity to develop an environmentally conscious, responsible lifestyle, which requires real life situations and experiences. The aim of the self-directed, self-regulated learning process implemented in connection with the independent exploration of topics is to develop the ability of lifelong learning. During self-regulated learning, the student is able to formulate his/her personal goals in accordance with his / her own needs, to work for achieving them and to set new and new goals in connection with the experience of success, thus to motivate oneself. The internal motivation encourages learning.

Project education is theoretically suitable for acquisition of all learning units, but it is indispensable in those complex topics where the task is to understand the contexts, to acquire a behavior that presumes acquisition of specific experience in the cognition process.

Strategic steps in project education

During project education, the path to achieve personal goals can be divided into three well-separable spheres of activity. [4]

- 1) Students choose a topic (or the teacher chooses a topic in a guided way) and in connection with the chosen topic they recognize, understand the problems related to the given project topic, their cause effect contexts and designate the main goal leading to the solution. They form groups and formulate further specific problems and sub-goals within the group or individually that are necessary to achieve the main goal. They select the sub-topic they feel they are able to solve.
- 2) During the elaboration and planning process, the tasks necessary to achieve the sub-objectives are formulated and their solution plan is elaborated. Data is collected, work is distributed, the appropriate form of work and durations are specified. They appoint responsible team members.
- 3) In the execution phase, they analyse the facts, systematize and process the data, solve the problem, and present the finished product.

Within the three main areas of activity, steps of the teaching-learning strategy of project education are the following:

- Students recognize and understand the problems of a given or chosen project topic (project), their cause effect contexts, and identify the main goal leading to the solution.
- With the help of the teacher, students formulate additional specific problems in groups or individually and formulate goals (sub-goals) to achieve the main goal.
- In the voluntary groups, the students choose topics from the problems coming up and formulated, which they feel they will be able to solve.
- Students make a plan for the solution process and formulate the tasks.
- They discuss in groups the distribution of tasks, the locations of data collection, the selection of potential informants, they plan potential sponsors and contributors, and appoint team members Responsible for such sub-tasks.
- Active implementation is completed with -optional- teacher assistance in group, pair or individual work.
- The product presentation, presentation of the project process takes place in front of the teams.

- Project evaluation: the self-evaluation focuses on the project preparation process, the team evaluation focuses on the presentation, the jury evaluation focuses on the project activity and the product.
- Make the necessary adjustments based on the suggestions made during the evaluation.
- Final publication of the project after completing the corrections.

In the process of project education, learning basically takes place in groups or individualized organizational forms. When organizing the activity and solving the tasks, the emphasis is on working together, helping and accepting each other, and acquiring communication skills and techniques.

Project planning should meet the following criteria [5]:

- 1) The project should focus on a problem.
- 2) The problem solving through the activity should be related to the real situations.
- 3) Provide opportunities for individualized work (portfolio).
- 4) Give opportunity to work in groups.
- 5) The duration of the project should cover the diligence period of one academic semester.
- 6) The goal should be to solve a real environmental problem.
- 7) Create a connection between subjects, characterized by multidisciplinary.
- 8) The relationship between the student and the instructor should be characterized by a partnership.
- 9) Students should make their own decisions and be responsible for their decisions.
- 10) Roles of the teacher are the encouragement, organization, consultancy, guiding works from the background.
- 11) Students should be able to collaborate.

Defining method of project teaching is the project method, which is always purposeful, problem-oriented, based on interest and active activity of the students. Its direct connection to the real world presupposes the expansion of the school learning environment. In the project method, there is a high level of interaction about the events of the project, thus the project activity becomes a real created activity [6].

CONCLUSION

One of the cornerstones of engineering education is whether, in addition to high-level scientific theoretical training, we can implement practice-oriented training in the future, which creates an opportunity to develop the abilities and skills expected of engineers - responsibility, environmental awareness, ethical thinking. The driver to do this seems to be reflected in the training and output requirements, which clearly articulate the need to develop the competencies expected from the education. However, this is only possible with well-chosen pedagogical methods, so in addition to lecture and explanation methods, which were the most important in education so far, activity-oriented methods must also appear, as they provide the opportunity for independent and group work, research and experiments, where students can gain experience.

During the project work, the students processed the professional curriculum independently with a flexible schedule, helping each other's work in a group activity. Their knowledge has become applicable knowledge, which is due to a greater proportion of activity-oriented methods built into the educational process. Working together developed interoperability, human relationships, social competencies, and adaptability. The students' portfolios and work diaries testify that the students enjoyed the work, they had motivation to learn, in which the successes also appeared as an important factor.

The results confirm that project education is suitable for the implementation of competence-based environmental engineering basic training and in the future, based on the developed educational methodology, it should be gradually applied within more and more professional subjects. However, an important condition for this is that instructors must also be prepared to apply new pedagogical methods.

References

- [1] Fokozatváltás a felsőoktatásban középtávú szakpolitikai stratégia, 2016 a Kormány jóváhagyta 1785/2016. (XII. 16.) Korm. határozatával,
<http://www.kormany.hu/download/3/18/e0000/20161202%20Fokozatv%C3%A1lt%C3%A1s%20%20a%20fels>

oktatásban%20környezetpedagógiáig.pdf (2017. január 21.)

- [2] 18/2016. (VIII. 5.) EMMI rendelet a felsőoktatási szakképzések, az alap- és mesterképzések képzési és kimeneti követelményeiről, valamint a tanári felkészítés közös követelményeiről és az egyes tanárszakok képzési és kimeneti követelményeiről szóló 8/2013. (I. 30.) EMMI rendelet módosításáról
 - [3] Kovács-Németh, M. (2010): Az erdőpedagógiától a környezetpedagógiáig, Pécs, Comenius Kft., 206.o., ISBN 978 963 9687 18 9
 - [4] FEKETE J. Gy. (2010): Gondolatok a környezetmérnök oktatásról, Környezetvédelem 2010/3, 26. o.
 - [5] Bodáné Kendrovics, R. (2015): A projekt módszer alkalmazása a Vízminőség-védelem tantárgy oktatásában, In.: A környezetpedagógiai elmélete és gyakorlata (Szerk.: Dr. Kovács Németh Mária – Bodáné Dr. Kendrovics Rita) Győr, Palatia Nyomda és Kiadó Kft., ISBN978 963 7692 64 2
 - [6] Frei, K. (1991): Die Projektmethode. Weinheim, Basel. Freinet
- All the references must be correct, complete.
Write references in following style.