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PROJECT METHOD, AS ONE OF THE BASIC METHODS OF ENVIRONMENTAL EDUCATION

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Abstract: Our aim was to present in this paper the one of the most important methods of environmental education, the project method. We present here the steps and phases of project method and we give an example of how to use these elements in planning an activity for celebrating the World Day for Water.

Zusammenfassung: Unser Ziel war es, in diesem Papier die eine der wichtigsten Methoden der Umweltbildung, das Projekt Methode. Wir stellen Ihnen hier die Schritte und Phasen der Projekt-Methode, und wir geben ein Beispiel dafür, wie die Verwendung dieser Elemente bei der Planung einer Tätigkeit für feiert der Welttag für Wasser.

Keywords: environmental education, project method, water.

1. Introduction

One of our primary educational aims is to make our students able to think independently, so that they would face problems well prepared out of the school as well, they would use their knowledge and abilities for the sake of the environment and the society, to make them think creatively. For this they need positive experiences gained in the course of the learning process, which are sources of energy and enthusiasm for them. The creative problem solving method ensures a perfect aid to this. We can apply this method to individuals and groups in order to collect, process and carry out ideas. The basics of the creative problem solving were laid in the 1950s by Alex Osborn, who is also known for creating the technique of brainstorming. The theory, which later was improved with the contribution of Sidney Parnes, stands at the ground of several creative problem solving methods. It encourages people to handle issues they are facing efficiently and effectively, and it makes them able to treat them more easily and from a new perspective. Today the creative problem solving method is acknowledged all over the world, and it is used efficiently by many organisations and companies, including schools, firms and government offices. The model is flexible, it can be used both on long and short term, and it can be easily suited to special conditions.

Creative problem solving is particularly useful during the development and accomplishment of environmental projects in schools. The project method has several steps: the teacher and the students examine a certain environmental topic, they choose a problem which is important to them, then they develop and carry out an action plan. With each step the students assume more and more the role of a manager able to treat environmental topics. Responsibility is passed on gradually from the teacher to the students; at the beginning it is the teacher who guides the process and establishes the main lines, later the students take over the project management, and the teacher becomes an observer. The teacher controls the advancement of the students, he ensures the possibility to change roles by developing the knowledge and skills of the students, assessing their performance with criticism, and introducing new ideas and methods in the learning process, thus eliminating the factors which limit their development.

2. Phases and steps of the project management

Step 1: Preparation, getting involved

Students can get acquainted with the topic to be worked on in two ways: with the tools of the divergence and of the convergence. The aim of the divergence is to approach the topic from new and exciting perspectives, thus to learn about endless variations. Students can use divergence to collect ideas, alternatives and possibilities. For this we can apply the tool of brainstorming: the teacher, who plays the role of the helper, writes the topic on a board or paper, and adds to it the ideas of the students. The aim is to collect as much interesting and creative ideas as we can.

In the course of the convergence we analyse and compare the ideas collected through divergence, and we select the most promising ones. We can make a list (individually or in group) of the most interesting ideas, we can choose those which are worth of working on in order to carry out the project. Convergence (the discovery of the topic) and divergence (selection of ideas) are at the core of the creative method. The introduction of the topic has to be from various angles; if the topic is not interesting for a young, we didn't achieve anything. The groups participating at the activity must know clearly the requirements we have against them.

Step 2: The examination of the topic

We ought to collect information on the topic or problem in as many ways and from as many sources as possible. We should ensure the possibility for the students to present the information known or collected by them.

We should use the following questions:

What do you know about the topic/problem? (Who? What? Where? When? Why? How?)

What are your impressions concerning the topic/problem? What did you notice?

What do you think is the most important concerning the topic/problem?

The best way of processing a topic and launching the project is the group work.

Students can use alternative information sources, like the internet, newspaper articles, books, lectures of invited teachers, information furnished by firms, the expert opinion of their parents and of other teachers. At the end of each information collection we can assess through the technique of inquiry to what degree the students have understood the foregoing. Through the inquiry the teacher and the students have the possibility to share information and to establish the main guidelines of the future work. The following questions are to be applied during inquiry:

What did you experience? How did it happen? What did you notice?

What comes to your mind concerning this?

How could you use this? What did you learn today?

Step 3: The elaboration of the action plan

After they have collected information on a general topic, the students are ready to choose a precise target or task related to the topic. This is followed by the distribution of the tasks to be accomplished, the schedule and the definition of the key events. In this phase individual ideas can be developed, for original thoughts and unique solutions are welcome, but it is also the most time-consuming step. We ought to answer the following questions: 'What measures are needed in order to realize our target?' 'Who or what could be of use for us?' And 'Who or what impedes us?' Each step has to be accomplished within a certain deadline, and each step has to have a responsible.

Step 4: The fulfilment of the action plan

The task assignment, the collection of ideas and the preparation are followed by the fulfilment of the action plan. Students ought to experience success during the first steps already, thus they would not loose their enthusiasm. We should remove obstacles – these can be material ones, but the shortness of time can cause difficulties as well. We shouldn't forget that though the students start the project as 'learners', during steps 2, 3 and 4 they become active 'executives', while they use the tools of creative problem solving in order to take the necessary measures, to assign the tasks and to reach their target. As the process advances, the teacher has to shift more and more responsibility to the students. We can assign group leaders, certain students can be made responsible for the equipment, and others can present the following tasks to their colleagues. We should make efforts to maintain the students' enthusiasm all along the project. If the students find joy and aims in their work, the project will be sustainable and it can be developed further.

Step 5: Presentation

The groups don't present the accomplished work, but the results of it. A precious result is turned into success by the others' appreciation and recognition.

Step 6: Evaluation, review, feedback

Students must experience success during the project; we ought to appreciate originality, the precision of the execution, the good decisions. The success of the students increases their self-confidence, which is indispensable to the serious work outside the community.

Step 7: Planning the future

This step is needed if we continue to work on the project, or if we transmit the results to other group.

3. Project types

1. **Exploration, assessment, examination projects**, i.e. the identification of the sources of pollution in case of a stream

2. **Presentation**: it renders accessible the acquired knowledge and information with others (editing of notice-boards, uploading a data-base)

3. **Mobilizing**: students get acquainted with an environmental issue by participating in its solving through active work (tree planting, waste collection, organizing a trade for environmental friendly materials)

4. **Creative, expressive**: exhibition organizing, presenting a *tableau vivant* ('living picture'), playing dramatic situations

5. **Experimental**: during the task fulfilment the students have experiences, which develop their environmental identity.

6. **Problem solving, conflict treatment**: the task is to solve or simulate an environmental problem or conflict affecting the students as well, i.e. What can we do, if the bus station is located in front of the school? What should the school garden look like?

4. Draft plan for celebrating the World Day for Water

"Unlike other products, water is not a commercial product, but a heritage we must preserve, protect and handle." (Water Framework Directive)

Motto: Water, health, life
Topic: The role of water in the life of living beings
Parts of the topic: the relationship of the plants and animals with water, the influence of man on watery biota, pollution
Target community: pupils of the 6th grade
Project duration: one week (March 17-22)
Aims:

- getting to know the water, as natural heritage
- learning about the importance of water in the life of living beings
- learning about pollution and sources of pollution
- development of skills of information collection and processing
- introduction of a proper language

Methods and procedures: conversation, observation, experimentation, discovery, raising of problems, analyse, individual work, group work, didactic play
Sources: periodicals (Természet világa, Csodálatos állatvilág, Tudás fája, Élővilág, Kárpát-medence állatvilága etc.), encyclopaedia, collections, internet
Guests: doctor, biologist, parents of the pupils

Step 1: Preparation, introduction

We ask the children to imagine how life would be without water. We give them a few minutes to think, then everybody tells what they think would happen to the environment without water. We talk with the children about the role they think water plays in the life of the living beings. It should be expressed that water is used in housekeeping (washing of clothes and dishes, washing, cooking), we drink water. Water is essential for many living beings, for water-plants and animals, but it has an important role in the life of humans as well, see hydroelectric plants (these produce energy), leisure (fishing, tourism etc.).

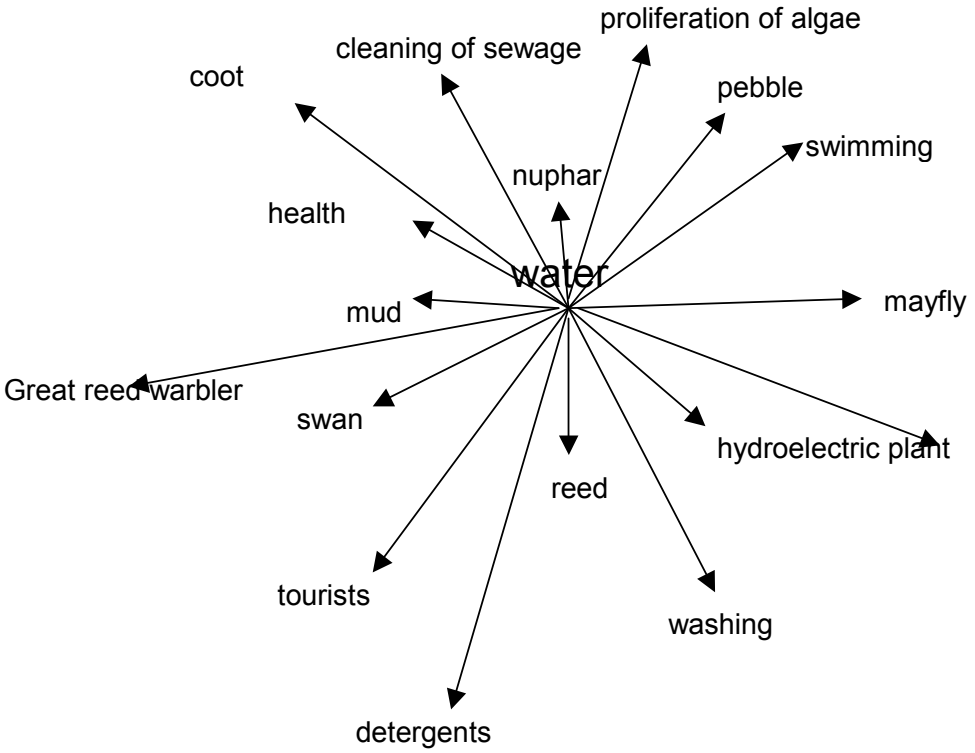

Figure 1. *Brainstorming*

Step 2: Examination of the topic, data collection

Children gather information in groups concerning several areas:

- Group 1: animals living in water (learning and presentation of 5 invertebrate and 5 vertebrate species)
- Group 2: learning and presentation of water-plants
- Group 3: types of pollution, effects of pollution on the watery fauna
- Group 4: what do humans use the water for?
- Group 5: collection and presentation of energy saving advises concerning water
- Group 6 – handwork group: making of posters and of a model

Invited lecturers:

Hydro biologist – the topic of their lecture: pollution and its types, the effect of persistent pollution on watery faunae, indicative species (species the presence or lack of which indicates the – negative or positive – effect of an environmental factor on the specific fauna)

Doctor – the topic of their lecture: advices for washing, history and role of washing in human life

At the end of data collection we recall the gathered information through inquiry.

Step 3: Elaboration of the action plan

Data collection is followed by the elaboration of the action plan. Our target is the learning of the watery fauna of a nearby creek, the discovery of possible pollution sources, and the collection of waste on a longer section (5 km). We assign the sampling locations (one within each kilometre) along a section known from previous trips, we present the children the sampling tools (bentometer, net).

We talk about the **water drop**, which falls of the cloud, flops about in the water and goes through many adventures until it reaches the sea. The same drop drips from the tap at home, if we forget to turn it off. The task of the handwork group is to make a model of the drop's journey on the basis of our tale. The group

which was engaged in the types of pollution and its effects on living beings receives the task to demonstrate through a simple experiment what they have learnt.

Step 4: Carrying out the action plan

On the first two days of the week the topic is presented, ideas and information are collected; on the third day children listen to the lectures of the invited persons. On the forth day we go with the children to see the chosen creek. With the help of the microbiologist the first group will identify the main groups of the watery macro-invertebrates; the second group will study water-plants, the third will get to know the indicator species (mayflies, stone-flies, larvae, snails, trichopterae), and will try to identify individuals of these groups on the indicated part. Each group participates in the collection of waste. On the fifth day each group will make a poster, which can contain drawings, pictures, text, information, explanations concerning the observed groups (plants, animals, indicator species) and the advices for energy saving. One group will demonstrate on a poster the collection of waste in the surroundings of the creek (for this they make photos during the work); the poster may contain "Before/ After" part too.

On the sixth day the posters and the model will be exhibited in the school room, and the children make preparations in the "Scientists' corner" for the experience to be carried out:

The pollution

Aim of the experience: we observe the effect of a minor pollution on a creek and its biota.

Accessories: a 4 litre bottle, a measuring-cup of 250 ml, red food colorant

Duties:

- Pour half cup of water in the bottle of 4 litres!
- Add two drops of colorant and mix it!
- Pour water into the bottle using the cup until the red colour disappears!

Expected result: approximately seven cups of water must be added in order to make the red colour disappear.

Explanation: red colour can be seen, because the molecules of the colorant are close enough to each other for being visible. By adding clean water the molecules of the colorant will disperse evenly in the water, finally they will get far enough from each other to become invisible because of their small size. Something similar happens with certain pollutants in water: the material might be visible at the beginning at the place where it got into the creek, but as it flows away and gets mixed with more and more water, it won't be visible to the naked eye anymore. This doesn't mean that the pollution ended, alike the colorant it is still present in the water. In the same way pollutants affect the biota of the creek many kilometres after the source of the pollution.

Step 5: Presentation

On the sixth day the groups will present the posters and the model they have made, the "Scientists' corner" will carry out the experience. We can invite to the presentation the children's parents, the management of the school, the fellow-students.

We play the "**Everything is connected to everything**" game: we stick on each player a slip with the name of a living being, natural phenomenon, human action: the extinction of fishes, the depletion of the ozone layer, humans' health, the pollution of subsoil water, sewage, plankton destruction, mating of mayflies, waste storing, dying out of water birds, concreting of riverbanks, chemicals, oil, artificial fertilizer, floods, proliferation of algae, lack of oxygen, natural cleaning of waters, sunshine. Players sit in a circle, one of them holds a string, they choose a partner, tell the relation between their two elements, throw the string; the next one will choose a third element, tells the connection, throws the string away etc. In the meantime a somewhat perplexed system takes shape, and the participants can complete each other's contribution. Thus we present the importance of water and how many things are in connection with water.

Step 6: Evaluation, review

We evaluate the performance of pupils and we draw the conclusions together: we must take care of water, we ought not to waste it, we should keep our waterways clean, so that future generations would have the possibility to enjoy the dance of dragonflies, the mating of may-flies, the croak of frogs, the beauty of vast fields of nymphaea.

5. Conclusions

The project method can be used efficiently in resolving environmental problems with pupils in a creative way. The project method is a target-driven activity based on challenge, fostering success and efficient cooperation, during which the *students' activity* gains more weight than the communication of knowledge by the teacher. By the end of the project the students can elaborate a material or intellectual product, which reveals the specific topic or thought in its most broad connections.

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