

Fieldwork on selected educational paths

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Abstract

The paper concerns the possibilities of using educational paths as one form of fieldwork for activating learning. Educational paths, also fostering informal education of a wider society, allow for conducting direct observations and measurements, and are a great source of knowledge about the immediate environment. This form of learning enables interdisciplinary education, combining geography with other school subjects. To become a useful tool in education, however, an educational path needs to be carefully designed and built and accompanied by teacher's materials (guide and handouts). All the examples of educational paths given in the paper come from the Kujawsko-Pomorskie Voivodeship (Poland).

Keywords: fieldwork, educational paths, interdisciplinary education, Kujawsko-Pomorskie Voivodeship (Poland).

Introduction

The reform of the education system in Poland, started in 1999 and subsequently modified, was a significant challenge to the entire society. Appropriate regulations supported the implementation of profound changes in the methodology of teaching. Deliberate changes in those terms, i.e. moving away from acquiring knowledge by memorising towards acquiring and applying knowledge in practice, have led to the spread of the activating methods in the teaching-learning process, including fieldwork, which is one of practical methods. One possibility of out of classroom teaching is using educational paths. The concepts of an educational path (*ścieżka dydaktyczna*) and interdisciplinary education (*ścieżka edukacyjna*), terms easily confused in the Polish educational practise, need to be clarified.

Specialised literature offers various definitions of an educational path (*ścieżka dydaktyczna*), but generally the term is defined as a trail of a permanently marked route, along which are stops (*stopping points*) with *information boards*. These boards would contain short texts, diagrams, questions and instructions about the objects nearby. On the other hand, according to the *National curriculum for general education*, the term *interdisciplinary education* (*ścieżka edukacyjna*) should be understood as [...] *a set of educationally essential content and skills, the implementation of which may take place while teaching different subjects (subject areas) or as a separate class*. It follows that the terms *educational path* (*ścieżka dydaktyczna*) and *interdisciplinary education* (*ścieżka edukacyjna*) have a different range of meaning and thus their interchangeable use is a big mistake, leading to confusion – unfortunately still quite common in the Polish educational practise.

Educational paths are to play an important function of familiarising children and young people with the environment of an area, in particular their own region. Therefore, this article discusses the use of the environment of Kujawsko-Pomorskie Voivodeship in those terms, supported by the selected well-tested examples from the area of Grudziądz, Toruń and Biskupin. Kujawsko-Pomorskie Voivodeship offers many places favourable to teaching of geography outside the classroom that can be used for educational, research and at the same time recreational purposes. Within the region there are landscape parks with various topographic forms, where rich and varied nature is preserved.

Forms of fieldwork

As geography is a school subject dealing with the influence of environment on the human population and the effects of human activity on the environment, the observation of processes and phenomena where they naturally occur plays a special role in its teaching. The type of work that contributes to direct observations

combined with measurements is fieldwork, i.e. *outdoor lessons* (lesson trips), *field trips and field workshops* (Krzywańska 1999, Podgórski 1997).

Outdoor lessons are classes that last one or two 45-min lessons. They are carried out in the immediate vicinity of the school; therefore they require only minimal resources and preparation on the part of the teacher and students. These classes are intended to implement the specific provisions of the curriculum – the achievement of chosen objectives. During the classes of this type, the topics may include orienteering, horizon and cardinal directions, or rocks of the surrounding area.

Field trips are a few hour-long extra-curricular activities. They have clear objectives and a well prepared detailed program. They rely on multi-component observation of nature and objects of material culture. The themes of this type of outdoor activities are closely dependent on the age and interests of the students. During nature trips broader issues are realised, such as understanding natural and historical values of the region, or understanding functioning of the area under legal protection (e.g. nature reserve, landscape park), etc.

Field workshops are practical classes based on the use of detailed instructions for the student and properly matched teaching resources. They are an excellent form, possible to use during school trips, while carrying out teaching in the so-called 'green schools' (field studies centres), and while following the route of *an educational path*. Workshops of this nature are very attractive because of the informative values of the route as well as the possibility to combine interdisciplinary education with various forms of recreation.

Outdoor activities are a great source of knowledge about the environment in which they are conducted. They may involve the immediate school area, the region or the entire country. They offer pupils the opportunity to observe the components of the environment, take their description, and use the teaching resources (e.g. compasses, maps, guidebooks and measuring equipment). These types of classes promote the formation of desirable social attitudes, develop cognitive activity, and teach responsibility and discipline, as well as form emotional bonds and contribute to the proper relationship with nature.

All of the above forms serve to achieve the objectives of education – deepening knowledge and improving skills. Depending on the age of the students, i.e. their perception capabilities, the scope of the selected activities will be different, as different will be the contribution of the students to the formulation of conclusions.

Outdoor activities should primarily be dynamic, and choosing a topic should be based on the substantive considerations.

Outdoor activities are usually carried out according to the rules of the collective work, or (in the higher grades) using student teams working at separate sites, in accordance with the instructions prepared by the teacher. The results obtained in the course of the outdoor activities are subject to a detailed discussion and generalisation. For the expected positive effects of school classes, a necessary condition is its appropriate preparation, both in terms of content and methodology, which is manifested through a lesson scenario. In terms of the outline, the out of classroom lesson scenario is highly similar to an indoor lesson plan. However, greater emphasis should be placed on efficient and well-thought organisation of activities of students, because being outside the school favours unplanned (unintended) and sometimes even dangerous situations. Other preparatory work includes the necessary tools and materials, the nature and usage of which is dependent on the adopted course of fieldwork and the selection of the place where the individual fieldwork steps will take place. Due to the limited amount of time, that place is the most immediate neighbourhood of the school building. Regardless of the distance criterion that must be taken into account in this case, the final choice of the fieldwork site should be decided on the merits of its usefulness.

Using educational paths

The idea of creating educational paths directly stems from the conviction of the need for various forms of public education, according to the idea of education for sustainable development. This idea is realised via the long-term formal and informal public education, and the need for the development of human activities in harmony with nature. This is because the idea of sustainable development can be accepted only by people with a certain level of ecological consciousness and culture. These values, as called for by K. Becmer and G. Sobieszak (1997), should be conveyed by the school (*formal education*), but also by other institutions and organisations (*informal education*). The traditional system of education, which aims to transfer theoretical knowledge, turns out to be insufficient emotionally and practically. On the other hand, being outdoors provides an opportunity for direct contact with nature, and for observation and measurement of its individual components. Staying outside the classroom and doing substantive work in the field opens the world of emotions to young people (but also to adults), which motivates them to take action to protect the environment. To educate society effectively, from an early age young people should be taught about the environment using in the process biotic and abiotic components near the student. Contact with and observation of the world around will allow students to deepen their true interests.

These tasks can be fulfilled by teaching geographical content if conducted with the use of educational paths. In this case, well-thought out and implemented educational concepts can also be used for public education of a large part of society in both formal (institutional) or informal manner, and not just a narrow selected group of people.

Learning objectives pursued by their use are manifold:

- drawing attention to objects, phenomena and processes particularly interesting from the point of view of the natural, cultural, social and economic perspective;
- improving substantially those skills mentioned in the geography curriculum, the improvement of which is not possible in the classroom;
- developing the habit to work independently as well as the developing teamwork skills;
- mastering the knowledge and skills using educational methods such as direct observation, measurement, reasoning (deduction and induction);
- learning a positive attitude to nature;
- familiarising with the natural seasonal changes;
- regulating tourist traffic in a particular area, which is particularly important for the areas subject to legal protection.

The condition for the educational paths to fulfil the role assigned to them in regional educational is that they are carefully designed and equipped in educational materials, allowing for independent work in the field. Such educational materials include: methodological guide, which contains a comprehensive description of the route, sets of individual and team tasks as well as instructions for their completion. A properly prepared guide should also include suggestions for teachers referring to the choice of issues to be implemented at different levels of education (Morko 2005). The development of the educational path should harmonise with the surrounding nature.

The technical equipment of an educational path includes:

- signs that trace out the route;
- information boards containing text and graphic elements in the right proportions;
- viewpoints and places to conduct observation of the learning objects;
- sheds and shelters as well as a camping site with a designated place for a bonfire.

Educational paths are an excellent means in teaching many school subjects. To achieve the expected results, the teacher should follow this procedure (Berne 1984, Podgórski 1997, Becmer 2000):

- planning and preparing an appropriate set of exercises (determining the scope of the material to work on outdoors and how to link it with the curricula of geography and other subjects; determining the role out of classroom learning will perform in the teaching-learning process; planning which topics will be revised or deepened via observations and measurements, and which will be introduced as new, etc.; determining the method of note-taking, making sketches and measurements during the course on the nature trail and planning tasks to be implemented after returning to the classroom);
- carrying out fieldwork activities with the appropriately selected groups of students (discussing the goals and topics of the tasks to be performed, conducting observations and measurements with simultaneous recording of the results, independent execution of tasks on the basis of worksheets, etc.).
- summarising and exchanging observations as well as drawing conclusions; assessment of student work.

The planning phase is based on the teacher's studying a given educational path, i.e. its route, and selecting objects and phenomena for the research appropriate for a group of students for observations and measurements, as well as preparation of worksheets and equipment appropriate to the research to be carried out and skills to be practised.

The conducting phase on the educational path is based on the following principles: division of students into groups, specification of individual and collective tasks, filling in the worksheets.

The summary phase includes the preliminary summary of the activities when still in the field, while the main summary is conducted in the classroom – during a lesson when the teacher revises the activities realised outdoors and finally evaluates the work of the students. The assessment of students can and should take into account the student's involvement during the class, quantity and quality of the notes, sketches, drawings that make up the documentation of the fieldwork, the student's participation in the discussion, as well as his/her appropriate attitude to human malpractices in the environment.

Many years of observation of the outdoor activities indicate numerous teachers do not implement the last of the identified steps carefully. Poor organisation of work means that conclusions are often formulated in a hurry, sometimes in isolation

from the results. Meanwhile, an outdoor lesson is a great opportunity not only to learn the ins and outs of fieldwork, and to detect patterns and gain practical skills, etc. but also to learn how to develop the results and present them in a thoughtful and suggestive way. Creating graphic representations (e.g. posters), which are a kind of documentation of group work done in the field, is also to intentionally stimulate students emotionally.

Educational paths operating in Poland usually meet these criteria. Initiatives to create them are supported by school and local communities. Depending on the criterion, many types of educational paths are distinguished. Each path has unique educational values. Based on the content criterion, educational paths are divided into: monothematic paths, e.g. geographical, biological, forestry, etc.; and interdisciplinary paths.

On the other hand, considering the organiser and the area where the path is conducted, the following are delimited (Becmer 2000):

- fitness trails, used by teachers in nursery, primary education and physical education;
- tourist trails – marked on the maps, for the general public use;
- nature trails in national parks and nature parks, established by nature conservation services in collaboration with educators;
- educational forest path, the creation of which is coordinated by the specialised forestry services;
- educational paths designed of initiative of regional environmental education centres, as well as similar institutions and organisations;
- paths not marked in the field, used by the local school community.

Effectiveness of educational paths

According to K. Becmer (2000), educational paths allow for practical activating students during outdoor classes, especially those students who often cause difficulties during lessons traditionally implemented in a school building. Therefore, she advocates grading positively students for the work done out of the classroom. K. Becmer (2000) considers using educational paths in the teaching of other subjects important and thus calls for interdisciplinary education. In her view, educational paths may offer ideas for research conducted through extracurricular activities (in particular of school geographical clubs), constitute one of the sources in the preparations for the subject Olympiads, and pose attractive hiking trails for recreation.

M. Gancarz (2000) drew attention to the importance of linking school education to the natural environment. She stressed the importance of the problem, which is also present in other European countries and the United States, and concerns inadequate development of student skills necessary to function in the changing environment. This situation has its origins in education. The separation of man from the natural environment caused that the knowledge is not directly useful and fully used in life. The flow of content from the area of knowledge to the area of skills requires carefully selected teaching methods and techniques. The research cited by M. Gancarz (2000) shows that out of classroom learning:

- increases concentration;
- has a positive effect on the learning process;
- stimulates the child's motor skills and increases the activity of the senses;
- group work mobilises students to cooperate;
- being outdoors strengthens the body.

Characteristics of selected educational paths

The description of educational paths in this part of the paper is extremely synthetic as it is merely intended to show their different nature, and indicate further information available in the literature. It should also be noted that the authors of this study were directly involved in the development of some of these educational paths and they repeatedly worked on these paths with primary, junior high and high school students, university students of geography and science, as well as with teachers – postgraduate students of geography and science.

▪ Nature and forest educational path in Węgrów

The path runs across the gmina of Grudziądz in the vicinity of the Animal Shelter in Węgrów. The area is a friendly place for relaxation and education of children and youth. Since 1997 there is a seat of the Association of Friends of the Grudziądz Land*. The grounds are well landscaped and interestingly managed – there is a common room with a safe bonfire place nearby. The route of 2.5 km, leading mainly through a wooded area, was designed by Science NCU postgraduate students: Maria Kowalewska, Janina Maliszewska, Agata Saja, Krystyna Stawecka, Elżbieta Szcześnik and Elżbieta Wiśniewska (2001) as part of a thesis supervised by Z. Podgórski. The path was created with the aim of fostering passions of children and young people for nature and shaping the ecological and tourism culture throughout the community.

* In 1997, at the initiative of the gmina's mayor, the supervisor of the animal shelter in Węgrów and teachers of Grudziądz schools, the Association for Lovers of Nature, based in Węgrów, was started. Due to its nature and educational opportunities, this place has become a center of creative work of children, young people and teachers.

Following the path takes about two hours. It consists of seven teaching sites with 11 information boards, which can help implement any Science curriculum in the second stage of education. Implementation of the tasks on the *Nature and forest educational path in Węgrów* allows acquiring interdisciplinary knowledge and contributes to the creation of positive behavioural patterns. Along the path students can conduct independent observations and measurements using 15 types of worksheets, coordinated with objects explained on the information boards.

▪ Educational paths in Myślęcinek

The Forest Park of Culture and Leisure in Bydgoszcz (*Leśny Park Kultury i Wypoczynku – LPKiW*), with an area of 830 hectares, is located in the northern part of Bydgoszcz. It is commonly called "the park in Myślęcinek" from the name of the neighbourhood in which it is located. The park has eight educational paths proposed by the Kuyavian-Pomeranian Centre for Ecological Education (<http://www.myslecinek.pl/content/sciezki-dydaktyczne>):

- *Educational path "Zacisze"* – presenting natural plant communities of the Polish Lowland, including natural forest communities, forest animals, methods of economic exploitation of the forest and nature protection infrastructure.
- *Educational path for the blind in the Botanical Garden* (the only one in Poland);
- *Educational path "Getting to know mammals"* – located in the zoo, enables deeper understanding of selected mammal species;
- *Educational path "Getting to know trees"* – running through the grounds of the Botanical Garden;
- *Educational path "Rushes"* – running around the largest (10.5 ha) reservoir in the Forest Park, designed to illustrate the most important properties of ecosystems and plants of the open waters shore;
- *Entomological educational path* – allows you to study insects of four different types of habitat (forest, mid-forest meadow, pond and rushes, sunny meadow);
- *Ornithological educational path "Birds of the Forest Park"* – gives the opportunity to observe behaviour of some bird species;
- *Agrobotanical educational path*.

From the geographical point of view the most interesting educational path seems to be the *Educational path "Zacisze"*, which takes the name after a local wilderness. The path is approx. 4-km loop, which can be covered in 2.5-3 hours. The route begins near the restaurant "Parkowa", at the pond with an island. From there to the north there is a view towards the escarpment edge, from which the path reaches

the bridge over the narrowest place of the pond. Then, the route runs through the forest, where are information boards with descriptions of plants and information about the phenomena and natural curiosities. The thematic scope is very wide as evidenced by the titles of the information boards: *Geomorphology*, *Forests of the Forest Park*, *Forest as an ecosystem and its importance*, *Hornbeam-oak forest - dominant forests in the Park*, *Lowland beech forest*, *Restoration of forest stands and their nursing*, *Forest protection against pests*, *Forest protection against fire*. The end point of the path is located near the Environmental Education Centre, where is a place to summarise the results of the outdoor classes.

Educational paths in the Forest Park of Culture and Leisure in Myślęcinek have been prepared for the education of children and adolescents. Observations made on the presented paths or at the Centre can be a very attractive and effective form of learning about nature.

▪ **Toruń on the Vistula – natural and cultural educational path**

The path was developed by a group of students from the Geography Student Research Club (R. Adamski, M. Bućko, M. Pająk, S. Tyszkowski) under the guidance of geography educators from the University of Nicolaus Copernicus (A. Zaklikiewicz and Z. Podgórski) to enrich the program of the 4th Toruń Science and Art Festival.

The educational path "Toruń on the Vistula" runs in close proximity to the Vistula's riverbed. It starts at the Bridge Gate (*Brama Mostowa*) (stop 1) and goes along the medieval walls of the Old City of Toruń to the building of the former Raclawickie Barracks (stop 2). Then the path leads across the bridge named after Józef Piłsudski onto the left bank of the Vistula. The next sites are on the isle of Kępa Bazarowa: at the Dybów Castle (stop 3) and in the nature reserve (stop 4). The path ends at the view point at the marina of the Sports Club "Budowlani", where it is possible to get a motor boat "Katarzynka" to the starting point. The observations and measurements taken along the path, as well as a variety of tasks included in the worksheets may extend the knowledge and develop practical skills of the participants. The implementation of the full program allows students to gain a rich set of achievements in the field of cognitive and motivational areas. The detailed description of this educational path was disseminated and described in a publication by Podgórski et al. (2005).

An example handout is given in **Appendix 1**.

Appendix 1

Old bridge across the Vistula

This is the second stop. In front of you is the bridge named after Marshal Józef Piłsudski. Getting to know its history, you will also learn some of the history of the city of Toruń and its relationship with the Vistula. You will learn many interesting things about the Queen of the Polish rivers.



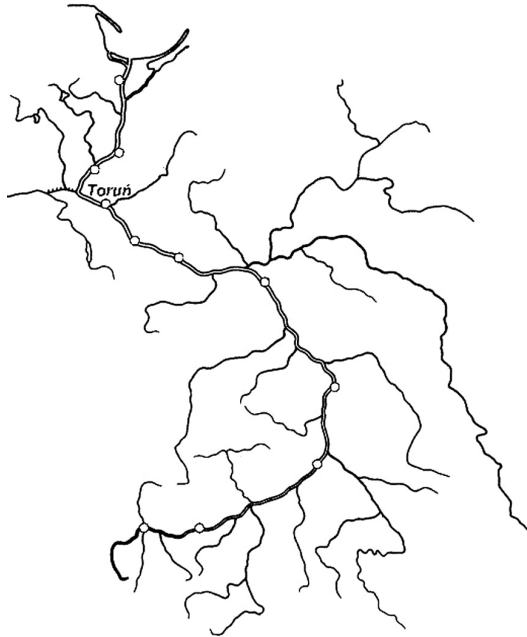
Group number:

Group members:

.....

1. Toruń is one of many cities located on the Vistula. On the map below insert the appropriate numbers to show the names of the cities.

1. Chełmno
2. Grudziądz
3. Kazimierz
4. Kraków
5. Oświęcim
6. Płock
7. Sandomierz
8. Warszawa
9. Włocławek
10. Tczew



Appendix 1 – continuation

2. Fill in the gaps in the text below with the names of geographical and historical regions.

Drwęca Valley, Kuyavia, Chełmno Lake District, Dobrzyń Lake District, Inowrocław Plain, Chełmno Land

Geographically, Toruń is located in the mezoregion of the Toruń Basin, which borders the from the south, the and from the east, as well as the from the north. Historically, the Old Town of Toruń is located within the, while the left-bank part of the modern city, i.e. Podgórz and the nearby district merged with the city in the 20th c. in the inter-war period, is located in the

3. Use a compass to determine the direction in which the Vistula flows at the section between the rail bridge and the old road bridge. Write the result down.

Measurement result:

Is it concordant with the general direction in which the river flows (south to north)? Why do you think it is so?

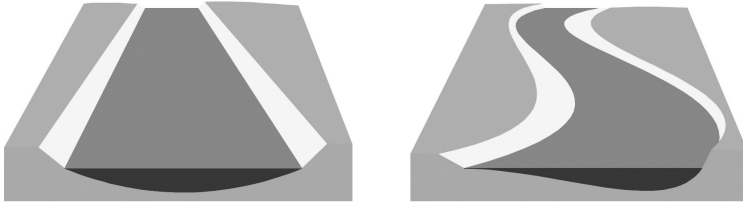
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4. Read the text carefully. Then do the tasks below.

*The depression in which a river flows is called **a river channel**. The fastest-flowing water stream is called **the current**. At a straight section of a river the current is often in the middle of the channel, which is **deep** there. At a meandering river section **lateral erosion** predominates. The current is then closer to the **concave** river bank. This bank is **steeper**, as it is eroded by the faster-flowing water. The opposite bank is often **gentler**. On this side of the channel the water flows slower and the process taking place there is **accumulation**, i.e. deposition of the material on the bottom. Due to accumulation the river channel becomes **shallower**, and sometimes sandbars develop.*

Appendix 1 – continuation

a) In the diagrams show the river current.



b) Where is the river current in the Vistula: in the middle of the channel or closer to one of the banks?*

.....

c) Name three elements which, according to you, indicate such a position of the Vistula current:

-
-
-

5. One of the features describing a river is the water velocity. It can be easily measured. To do so, you need a **timer**, **wooden stick** playing the role of a float, **chalk** to mark the place where you start and finish the measurement, and a **measuring tape** to measure the measurement section.

Follow these steps:

- a) Use the tape to measure a 10-metre section along which you will conduct the measurement; with a piece of chalk mark the beginning and the ending of the section.
- b) One team member should stand at the start point, while the other at the end point, both facing the river. While measuring is conducted, those students should signal the beginning of the measurement and the end of it when the float passes them.
- c) Another person should throw the float into the water a few metres before the beginning of the measurement. This is very important, as the float needs to float freely on the water surface along the entire measurement section. The measurement should be taken at least three times.

* To decide which is the right and which is the left bank of a river, stand facing the direction in which the river flows; the right bank is on your right side, while the left bank is on your left side.

Appendix 1 – continuation

d) Yet another student will be responsible for measuring the time with a timer. He or she needs to be concentrated so as to start and end the measurement exactly at the signal given by other students. The measurements results should be given in seconds.

Remember group work rules needed for the correct measurement!

Use the space below to write down the measurements and calculations:

Measurement 1:

Measurement 2:

Measurement 3:

Average the results dividing the sum of the measurement results by 3.

Calculations:

Result:

On (date) the Vistula water velocity at the measurement site was

6. Use a map to calculate the length of the bridge and the width of the river at that place. To do so, use the map scale.

Calculations:

Answer:

The length of the old road bridge across the Vistula in Toruń is metres.
The width of the river at that place is metres.

Conclusions

Improving school education should include all its components. Therefore, the role of the fieldwork on educational paths need to be increased in teaching and learning of geography, which directly results from the need to understand the environment of the student's immediate surroundings as well as the region and country, in correlation with other subjects. It is necessary to draw attention to the unique beauty of the landscapes of Kujawsko-Pomorskie Voivodeship, including the cultural landscape. The youngest students often do not notice, and consequently do not understand, the reality that surrounds them, so they need to be taught to conduct direct observations, prepare synthetic descriptions, express emotions, implement creative thinking, and above all perceive and evaluate the effects of changes that occur in their environment as a result of human activity.

Acquiring knowledge and skills in the course of implementation of tasks on educational paths, during excursions and walks, is both an adventure and out of classroom learning (Denek 1995). The uniqueness of teaching situations that occur during the course of this type of classes triggers cognitive activity of students, as manifested by the inquisitiveness of observation, posing many questions (which are often problematic), lively participation in the discussion. What the students tend to say then is spontaneous and more interesting, because it is enriched by the excitement while doing fieldwork. The joy of shared experiences and accomplishments, and impression of the immediate learning environment make fieldwork an important element of the comprehensive development of each student (Brodie, Harrison 2003). Direct contact with the environment is the basis for comparing, concluding and classifying of phenomena (Piskorz 1997, Ptasińska 2000).

The view of Groenwald M. (2005), to be considered legitimate, is that the development of an educational path pays back while conducting school trips and out of the classroom lessons. Such lessons can be led by teachers or students themselves, who can take the roles of guides to their peers. In the course of fieldwork students often give up personal desires in favour of the group, understand the need for a joint action, and develop their resourcefulness and the ability to overcome obstacles (solving problems). On the other hand, fieldwork enables teachers to know students better and evaluate the effectiveness of the applied teaching methods. A variety of tasks and exercises carried out on educational paths, particularly with maps and measuring instruments develop practical skills, especially spatial orientation.

Out of the classroom lessons favour informal, partnership atmosphere, evoke positive relationships based on action as well as creative thinking and emotions.

This method is more effective than teaching methods used in the classrooms. In addition, any form of outdoor activities, especially used at early stages of education where geographic content is integrated in the lessons of Science, is a positive element of learning, and thus affects the comprehensive development of the student, diversifies the process of teaching and education, and builds students' emotional bond with the environment. Bringing closer to students their own region in various aspects, among which the geographical aspect is extremely important, makes it clear to students that they have responsibilities and tasks related to their *little homeland*, which above all they should identify with, especially with the three basic attributes of their region, i.e. the territorial community, history and tradition as well as values of the territory.

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