

Scientific education as a tool for the development of environmental literacy

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Generally, we can consider education as a force in society that contributes to the right direction and offers the opportunity for innovation in different areas of life. The formation of pupils at an early age is crucial in shaping the attitudes and ideals that will guide their everyday decisions. Critical thinking, creativity, cooperation as well as communication play an indispensable role among the competences of the 21st century, which can be developed through environmental education in a very interesting and yet natural way. In Slovakia, there are currently relatively few opportunities to develop skills related to environmental issues.

Environmental education is only a cross-curricular topic, which reduces the time allocation for teaching and thus often negatively affects the level of effectiveness in this area of education. Environmental education is not a mandatory subject and many times depends on the teacher's ability and willingness to develop skills that contribute to increasing environmental literacy. The role of the teacher in such a case is demanding and requires complex preparation of the education process, including the selection of appropriate forms and methods of lessons. In this context, teachers lack integrated methodological approaches and guidelines. In the framework of the forthcoming reform of education in Slovakia, it is planned to provide mandatory education in the field of environmental issues and to support teachers in this area.

In addition to the availability of learning materials, the learning environment is also an important factor that influences the effectiveness of educational processes. In the case of environmental education, this should certainly not be exclusively limited to the classroom. Outdoor learning offers a variety of opportunities for pupils to explore and develop scientific skills.

The observation of animals and plants in their natural environment provides an objective view to the laws of nature. Through manipulation with living material and learning the procedures for measuring and analysing data, pupils learn the basics of scientific work. Working with determination keys develops procedural analysis and synthesis skills. Changing environmental conditions and the variability of learning aids allow pupils to propose hypotheses and suggest experiments to verify them.

Given the fact that interest in the natural sciences is often an afterthought in today's digital age, capturing promising scientists is challenging. On the other hand, digital technologies offer a number of applications, portals, virtual laboratories and animations that make accessible content that was until recently difficult to understand and is now a suitable object for pupils to model natural phenomena or laws interactively. It seems that linking outdoor learning with digital technologies can stimulate pupils' interest in science. Experiential outdoor learning supported by expert guidance from scientists and educational institutions enables pupils' own exploration and develops more effective science literacy competences. In terms of environmental issues, education should focus on biodiversity loss, revitalisation of native habitats and climate change mitigation.

An integral part of outdoor education should be to confront pupils with polluted environments and inhospitable conditions and to initiate discussion on proposals for solutions to current environmental problems. For effective comprehensive education, further training and support for teachers in implementing purposeful outdoor education is an essential component. The creation of a database of educational materials focused on outdoor education contributes to this. Given the diversity of organisms and biological processes and the resulting uncertainties, it is useful to allow practising teachers to have support in the form of expert online consultation. The way in which the young generation is educated about the environment should be innovative and reflect our society's need to solve problems towards sustainable development.