



## NATURAL SCIENCE EDUCATION IN PRIMARY SCHOOL: SOME SIGNIFICANT POINTS

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The problems of natural science education remain extremely relevant. Over the last two decades, international conferences and symposia dedicated to the study of issues of natural science education have been held in many countries and at various levels. It was especially emphasized that the natural science literacy of society is insufficient, and its relevance will only increase in the 21<sup>st</sup> century. Early natural science education promotes and develops natural science literacy (Ferreira et al., 2015). In general, various changes have taken place and are taking place in the field of natural science education: the content of education is changing, the search for more effective forms and methods of teaching is taking place, etc., on the other hand, new quality society needs are emerging. There is no doubt that the significance of natural science education for the development of a child's personality is extremely high.

One cannot disagree that although science education (SE) in primary school is implemented in an integrated form, it must be of high quality. In other words, primary school students should be able to make simple observations and experiments, formulate conclusions, use the simplest devices and instruments, etc. It is understandable that students' abilities are developed gradually and purposefully, that already from the first grade of primary school, students receive basic knowledge of nature, develop certain abilities, and finally, naturalistic world conception (naturalistic worldview) is formed (Lamanuskas & Augienė, 2021). Primary school students (aged 6/7-11/12) acquire and accumulate knowledge about the constant variability of nature and the surrounding natural and technological environment, about the change of materials under the influence of the most diverse factors. In general, the student receives knowledge about the surrounding world, i.e., knows it. The most significant result of such knowledge is – the formation of a position (the belief is developed) that the surrounding world can be known, i.e., the world is knowable.

Science education includes various components – ecological, environmental, healthy lifestyle, sustainable development, etc. Experimental-research activity is extremely important. Effective integration of all components into the educational process in primary grades remains problematic (Lamanuskas & Augienė, 2018). Various research studies emphasise that primary school teachers face various problems in teaching natural sciences at primary level. General problem is quite clear – students are not interested in natural sciences, or such interest is relatively low. According to the researchers, such problems, if not identified, can affect the quality of natural science teaching in the higher stage of general education (Garraway-Lashley, 2019). Researchers from foreign countries claim that little is still known about the position (opinion) of teachers regarding the goals of research activities, the processes of organisation and implementation of research activities, finally, about teachers' motivation to perform more complex research activities (Keys & Bryan, 2001). It is obvious that increasing motivation, promoting teacher



cooperation, appropriate support remains an important factor in improving natural science education (Watters & Ginns, 2000). On the other hand, it is important how primary school teachers can perceive new opportunities for natural science learning, as well as adequately understand the potential of SE. According to the researchers, it is necessary to explore how primary school teachers understand natural sciences and natural science teaching. In this way, it would be possible to clearly identify, what aspects of natural sciences are important at primary school level, and how they can turn into appropriate teaching/learning experiences (Fitzgerald & Smith, 2016). The problem also remains, when primary school teachers are not adequately prepared in the field of natural science education. Research shows that many primary school teachers avoid teaching natural sciences, lack science knowledge and often they lack confidence in teaching science (Mellado et al., 1998; Smith & Neale, 1989).

The results of the pilot study conducted in Lithuania in 2020 showed that primary school teachers use sufficiently diverse methods in natural science education of children. Most frequently is used students' involvement in practical work (activity), experiment demonstration, efforts are made to relate natural science content with the everyday students' life, to organise students' group work. Class discussions are much less encouraged, and students are allowed to conduct independent research (experiments). It is rarely sought to include technologies, to encourage (facilitate) research, to satisfy (take into account) individual differences of students (Lamanauskas, 2022). In the process of primary natural science education, the research most often conducted with students is related to healthy lifestyle, environmental protection, ecology. Less often students conduct research on vegetation (flora), animal life (fauna), and physical phenomena. Very rarely students conduct research related to agriculture / farming, the effects of chemicals on plants and animals. Especially rarely students research soil, minerals, and rocks. Teachers say that natural science education in primary school could be improved having more recourses / equipment, etc., including more practical work (activity), trying to bring natural science content closer to students' everyday life, making lessons more student centred, having better access to technologies and their use, reducing the number of students in classes. Some teachers indicate that it is important to devote more time to the selection, analysis of natural science content, etc., lesson preparation, to have more opportunities for teacher's professional development.

Thus, the importance of primary school teacher in the process of natural science and technological education process remains indisputably important. In addition, natural science competence of primary school teachers is one of the constituent parts of general professional competence (Lamanauskas, 2011). It is sought that teachers, using various methods and ways, should be able to motivate students to be interested in animate and inanimate nature, to apply already acquired knowledge and abilities in everyday life, to use information received in further education. It is important that education is organised creatively, encouraging students to think systematically, logically, and critically, and finally to develop cognitive abilities/capacities. It would be good to seek that students know the surrounding world as much as possible through research-experiential activity. Unlike the other subjects that can be learned by reading a textbook, natural science education must be practical (Hallez, 2008), research activity (education and learning through research activity) is crucial in developing and sustaining curiosity (Smith, 2016). What is more, primary school teacher must be an effective implementer of science education, but not the one, who can't teach science! and/or hate science (Kazempour, 2013).

Both teachers and curriculum developers, primary school training institutions should understand that natural science education at primary school level includes the transfer of empirical experience of understanding the world to the younger generation. In the same way, it includes the formation of ideas about the natural science concept of the world. Moreover, the understanding of the integrity and diversity of the world is formed. From the practical activity point of view, the foundation is laid for the understanding of nature research continuity.

For primary school students, natural science education is an effective way to solve educational problems relevant to them, choosing and expanding the circle of communication, choosing/forming life values and future career guidelines. The value of such education is primarily expressed in the fact that it strengthens the variable component of general education and helps children make decisions in personal and professional lives, helps realise personal immanent powers and previously acquired knowledge, abilities, and experience. It is regrettable that quite often in the current educational practice, natural science education is significantly distorted, following the so-called "modern" forms and strategies, associated with pseudo-integration, inclusion, STEM without STEM, and other fashionable, but temporary educational subjects. It doesn't matter in what form natural science education is implemented in primary school (e.g., in Lithuanian primary schools through "World cognition" subject), it is inevitably/inseparably related to natural sciences. Natural science knowledge consists of correct understanding of facts and a relationship between them, which in turn allows identifying certain models, as a basis for new knowledge and technology creation. And this is an obvious methodological position.



Thus, nature cognition (in a wider sense) is a complex, specific thing. A person needs to be prepared for this – taught to explore, feel nature, communicate directly with it. Understanding the value of nature, experiencing the value of nature and practical embodiment of the value of nature are essential manifestations of the relationship between man and nature. This is one of the essential goals of science education in the new 21<sup>st</sup> century.

## References

- Ferreira, M. E., Porteiro, A. C., & Pitarma, R. (2015). Enhancing children's success in science learning: An experience of science teaching in teacher primary school training. *Journal of Education and Practice*, 6(8), 24-31. <https://eric.ed.gov/?id=EJ1082747>
- Fitzgerald, A., & Smith, K. (2016). Science that matters: Exploring science learning and teaching in primary schools. *Australian Journal of Teacher Education*, 41(4), 63-78. <https://files.eric.ed.gov/fulltext/EJ1098113.pdf>
- Garraway-Lashley, Y. M. (2019). Teaching science at the primary school level: "Problems teachers' are facing". *Asian Journal of Education and E-Learning*, 7(3), 81-94. <https://doi.org/10.24203/ajeel.v7i3.5847>
- Hallez, J. E. (2008). *The importance of science in the classroom and implications for teaching science effectively*. All Regis University Theses. 96. <https://epublications.regis.edu/theses/96>
- Kazempour, M. (2013). I can't teach science! A case study of an elementary pre-service teacher's intersection of science experiences, beliefs, attitude, and self-efficacy. *International Journal of Environmental & Science Education*, 9, 77-96. <https://doi.org/10.12973/ijese.2014.204a>
- Keys, C. W., & Bryan, L. A. (2001). Co-constructing inquiry-based science with teachers: Essential research for lasting reform. *Journal of Research in Science Teaching*, 38(6), 631-645.
- Lamanauskas, V. (2011). Some aspects of natural science literacy and competence of primary school teachers. *Problems of Education in the 21st Century*, 36(1), 5-9. <http://www.scientiasocialis.lt/pec/node/620>
- Lamanauskas, V. (2022). Natural science education in primary school: The position of teachers. In *XX IOSTE 2022, Recife. Anais eeletronicos*. Campinas, Galoa. <https://proceedings.science/ioste-2022/trabalhos/natural-science-education-in-primary-school-the-position-of-teachers>
- Lamanauskas, V., & Augienė, D. (2021). Gamtamokslinis ugdymas pradinėje mokykloje: procesas ir jo gerinimas [Natural science education in primary school: The process and its improvement]. *Gamtamokslinis ugdymas bendrojo ugdymo mokykloje / Natural Science Education in a Comprehensive School*, 27, 24-35. <https://doi.org/10.48127/gu/21.27.24>
- Mellado, V., Blanco, L. J., & Ruiz, C. (1998). A framework for learning to teach science in initial primary teacher education. *Journal of Science Teacher Education*, 9, 195-219. <https://www.jstor.org/stable/43156195>
- Smith, D. C., & Neale, D. C., (1989). The construction of subject matter knowledge in primary science teaching. *Teaching and Teacher Education*, 5(1), 1-20. [https://doi.org/10.1016/0742-051X\(89\)90015-2](https://doi.org/10.1016/0742-051X(89)90015-2)
- Smith, K. (2016). *Working scientifically: A guide for primary science teachers*. David Fulton.
- Watters J. J., & Ginns, I. S. (2000). Developing motivation to teach elementary science: Effect of collaborative and authentic learning practices in preservice education. *Journal of Science Teacher Education*, 11(4), 301-321. <https://doi.org/10.1023/A:1009429131064>

Received: October 28, 2022

Revised: November 12, 2022

Accepted: November 15, 2022

Cite as: Lamanauskas, V. (2022). Natural science education in primary school: Some significant points. *Journal of Baltic Science Education*, 21(6), 908-910. <https://doi.org/10.33225/jbse/22.21.908>

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