

LEARNERS' SCIENTIFIC RESEARCH ACTIVITY AS A KEY COMPONENT OF SCIENCE EDUCATION IN COMPREHENSIVE SCHOOL

Dear Readers!

The formation of scientific research activity abilities in comprehensive school is undoubtedly, a very important sphere still awaiting of particular attention. Current teaching and learning process has basically changed looking from the paradigmatic point of view. Teaching subjects become the means of realization of learners' demands and interests.

Scientific research activity is not an entertainment but a very responsible, thorough work requiring great self-independence. During this activity children's analytic thinking becomes stronger, information search and usage abilities are being developed, they can learn to analyze the accumulated material, make presentations, prepare research reports and so on. By doing scientific research, learners approach new knowledge and new methods to solve problems of daily life. The main question is how to combine scientific research and science education. First of all we should elaborate specific policies how to encourage our learners to do scientific research. This is also very important from political point of view. Different scientific research conducted for the last 10 years showed that secondary school learners have a perception of science education as irrelevant and difficult. On the other hand Europe needs more scientists (EC, 2004). We should make all our efforts how to attract secondary school learners to the scientific activity and how to orientate them for scientist (researcher) career in the future.

When we talking about such kind of learners' activity we often use different terms, for example, inquiry-based (structured inquiry, guided inquiry, open inquiry), exploratory activities etc. Use of different terms is of secondary importance at present. It is much more important to develop scientific research abilities at all stages of school education.

It is important to make more pupils interested in this activity. This shouldn't be the privilege of gifted pupils only. However, talking about the developing of scientific research activity at school, several essential questions arise:

- Is it possible to teach every child to perform research activity?
- What to do if a pupil wants to take up scientific research activity but school can't provide elementary conditions for this purpose (for example, there is no equipment, no competent leader and so on.)?
- How to integrate effectively scientific research elements into teaching content?

Nature research based on scientific methods and nature research results are linked by the process of *research* – from simple observation to primitive data-processing. Research activities are extremely invaluable for pupils. Moreover, schoolchildren have already got some rudimentary knowledge about natural science from the previous studies at school. The investigation shows (Stundžia, 1995) that primary school newcomers perfectly perceived and knew where to use a laboratory thermometer (80.7%), a chemical glass (73.6%), scale (54.2%), a funnel (15.7%). According to professor Šapokienė, exploration is 'a form of the organization of the educational process, when pupils become familiar with the basic methods of research, learn easily comprehensible elements of research methodology, obtain knowledge and skills to individually investigate phenomena of natural and environmental life' (Šapokienė, 1994). A few functions of practice are distinguished. The first one is the creation of specific images used for the further conclusion. Observation, demonstration, experimentation and laboratory findings are different methods to investigate and enrich sensual pupils' knowledge practically and promote the production



of visual-aids system (Šlekienė, 1999). Afterwards problematic situations can be performed in order pupils could more or less individually stimulate the process from abstract to specific and vice versa. The investigation demonstrates that children's activities exploring nature and its phenomena are organized, inspired and remain dynamic within spontaneous activities. However, it is directly influenced by individual interest, interpretation, exploration, testing and shared experience (Plytnikienė, Rimkevičienė, 2001). Children really like exploring.

However, secondary natural science education, first of all, is very complicated for the teacher. It is concerned with teacher competence as well as with his/her motivation in terms of the interaction with nature. Far more relevant aspect is that teachers arrange activities from the position of the adult, i.e. they somehow 'obtrude' the opinion upon children. Usually children's life does not belong to them but is controlled by the teacher who only takes care about learners' intellectual potency. Thus, the questions relevant for the child are of a secondary matter (Lamauskas, 2003).

Insufficient attention devoted to scientific research activities is one of the reasons why the classes of 'Science' are not popular among students in different countries. We can safely assert that especially in primary school practically not an appropriate attention is paid to formation of scientific-research abilities. It is obvious, that modern teaching process is not favorable orientating pupils for scientist (researcher) career. It is very important to analyze in detail which factors disturb/encourage to train pupils' interest in scientific-research activity. Finally, teacher's competence and also personal interest are very important while forming and developing pupils' scientific research abilities in teaching-learning process. Individually gained children's experience, social, etc. abilities are too mean to find out and perceive the intricate natural phenomena (for example, a child can't understand why twilight first appears in the forest, why a broken/cut tree grows up again, etc.). The teacher has to become an adviser in the way of knowledge as s/he has to help to find out the correct answers to the asked questions rather than to give clear statements (Kisieliūtė, 2002). It is a paradox but the teacher's approach to natural science education should directly influence the children's provisions in terms of nature study.

Thus, a key point of scientific research activity is that children themselves become knowledge hunters. Also it is clear that creating all possibilities for learners to conduct different research activities is a key component to successful science education. It is a pity that scientific research activity frequently stands outside the door of the science education process. Hence, opening the door is the obligation of all of us.

References

- European Commission (EC) (2004). *Europe Needs more Scientists. Report by the High Level group on Increasing Human Resources for Science and Technology in Europe*. Brussels.
- Kisieliūtė, E. (2002). Gamtotyros darbai pradinėje mokykloje. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (VIII respublikinės mokslinės konferencijos straipsnių rinkinys)*. Šiauliai.
- Lamauskas, V. (2003). *Natural Science Education in Contemporary School*. Šiauliai: Šiauliai University Press, p. 514.
- Plytnikienė, D., Rimkevičienė, B. (2001). Ikimokyklinio amžiaus vaikų tiriamoji veikla pažįstant gamtą. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (VII respublikinės mokslinės konferencijos straipsnių rinkinys)*. Šiauliai, 2001. P. 185-190.
- Stundžia, J. (1995). Chemija reformuotoje mokykloje. Kn.: *Gamtamokslinis ugdymas vidurinėje bendrojo lavinimo mokykloje: problemos ir perspektyvos*. Vilnius: Žaliasis pasaulis, p. 38-43.
- Šapokienė, E. (1994) (sudaryt.). *Aplinkotyra. Mokomoji knyga jaunimui*. Vilnius: Leidybos centras, p. 9.
- Šlekienė, V. (1999). Praktinių užduočių funkcijos gamtamokslinių sąvokų formavime. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (V respublikinės mokslinės konferencijos straipsnių rinkinys)*. Vilnius: Žaliasis pasaulis, p. 102-107.

