

THE IMPORTANCE OF STRENGTHENING OF NATURAL SCIENCE EDUCATION IN A PRIMARY SCHOOL

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Dear Readers!

To one who understands at least something about education it is obvious that science education in primary school is very important. Every person's education fundament is formed here. It is understandable that children before school already have certain knowledge about nature. Pre-school children have to know about animal, plant life, should have knowledge about objects and phenomena of inanimate nature, perceive the essence and meaning of care works. Research works show that pre-school children's knowledge about nature is not sufficiently exact and exhaustive. We should especially focus on enriching and making the knowledge about animal and plant acclimatization more accurate among 5-7 year old children (Ušeckienė, 2000). On the other hand, it is stated (applying modified Kern test) that in the group of 5-7 year old children cognizing nature and its phenomena an average level of thinking functions and intellect predominates which directly depends on child's mental maturity level and not on child's sex and age (Plynykienė, 2002). It is very important for this knowledge to be deepened and broadened in primary school, i.e., in the 1st -4th forms. In this case, natural science preparation quality largely depends on the teacher, on his competence in natural science. Since 1992 a new subject "The world science" has been introduced in primary school which can be interpreted as one of the components of natural science education. Currently in Lithuanian primary school science education fundamentals are integrated into the world cognition course. Biology, physics, chemistry, technological, ecological problems make the part of this natural science program. The main nature cognition purpose is to educate children's ability understand the world of nature and communicate with it. So, integration of natural science fundamentals on the one hand and social and natural science components on the other hand will further remain a very meaningful sphere of educational process in primary school.

On the basis of Lithuanian comprehensive school General Programs every teacher can create a detailed and specific world cognition teaching program, compatible with children's interests, maturity level and other personal features. However, this is not an easy task. No matter how much we reform the content of natural science education in primary school the problem of balancing such content remains unsolved. Going deeper into this content it becomes obvious that biological component predominates. However, the aim of world cognition course is not only natural science education but also education of social abilities and value standards. This especially burdens the quality of natural science process in general. Very often the integration of natural science and social components is mechanical, inconsequent and not systemic. Practicing teachers noticed long ago that world cognition course turns into the direction of social sciences and ethical education (Bučiuvienė, 2007). In General programs it is emphasized that the cognition of social sciences' concepts is not an end in itself. The same can be said about natural science concepts. But the latter haven't been selected up to now. It is not clear yet what related set of concepts it would be good to present to primary school pupils. In other words, there is no clear list of such concepts - especially this can be said about physical and chemical ones. All this remains an urgent didactic problem. The first steps have

already been made. The component of the content of chemistry in primary school is being tried to be selected and modeled (Lamanauskas, 2005). Why should we strengthen chemistry component in primary school? The question is not simple and a wide and deep discussion is possible here. First of all, referring to researches (Malinovskaya, 2002; Ševčiuk, 2005) we can claim that the interest of primary school pupils and of the 8th formers in chemistry as a subject is not only not weaker, but very often stronger. Children get very naturally a lot of information from surroundings (home surroundings, multi-media and so on). It is without doubt, that in primary school children can be introduced very widely to chemistry science propedeutics (e.g. the classification of the materials, different chemical combinations and so on). However, the worst situation is with modeling physics component. Physics component is also important ensuring a balanced natural science education in primary school, isn't it? In international practice excellent examples occur about how to strengthen natural science education in primary school. Modern ICT are particularly helpful for this. Various websites have been created where children as well as teachers can find a lot of valuable practical information. For example, ChemiCroc is a very interesting website, the purpose of which is to help children understand the world of chemistry. (<http://www.chemicroc.com/index.php?page=1>). In Finland the project Chemistry for Primary schools HEUREKA has been prepared and put into practice (Pilot Project: Chemistry for Primary Schools, http://www.xplora.org/ww/en/pub/xplora/nucleus_home/pencil/heureka.htm). A lot of valuable natural science material is given in Australian website (<http://www.primaryschool.com.au/science.php>).

Another important aspect of primary natural science education is to make the children observe, investigate nature, learn to discern the link between facts and phenomena, feel the integrity of the surrounding world. Children not only like this activity but this activity stimulates their interest in nature and surroundings. Foreign researchers often emphasize this: (English - *pupils want a more hands-on approach*). 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. 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). If it is possible, not complicated experiments, tests are carried out; planting and growing; dissolving, steaming; weighing and measuring. The pupils are taught and learn consequent research method: observation- analysis- hypothesis- checking it-conclusion. In primary school the teacher tries to make children observe, investigate nature, try to discern the link between facts and phenomena, their interrelationship, feel the integrity of the world. As Rauckienė states (1994), subjective factors play a great role in the child's cognition of nature: his willingness to find out, his mood and his concrete activity. Observations, demonstrating, tests, laboratory works and other practical research work enrich children's sensual knowledge and cause the creation of image system (Šlekienė, 1999). Later on, problem situations can be created in order pupils could more or less perform the process independently from abstract to concrete and vice versa. Researches show that children's investigation of nature and its phenomena during the organized, inspired and independent activity is dynamic but directly depends on every child's interests, ways to find out, investigate, experiment and share the experiences of the acquired results and their changes (Plytnykienė, 2001). Children like research activities. Researches show that the first formers value especially positively the tasks in their world cognition exercise books (34%), the second form pupils give priority to tests and experiments (30%), the third and fourth form pupils like experiments and tests as well (45% and 42% respectively) (Laurukėnaitė, 2002).

Teachers themselves are inclined to intensively explain, tell and very often establish the similarities and distinctions of nature bodies, depict their main features, etc. Schoolchildren most frequently stay passive observers, who are provided with a rare opportunity to research, prove, discover... Pupils' knowledge about inanimate nature gained during the classes of world science in primary school is not exhaustive but children's cognitive activities positively influence the quality of their knowledge... (Laurukėnaitė, 2002, p.52).

Insufficient attention to natural science research activity is one of the reasons why “World science” lessons are not liked by pupils. This can have influence on further natural science education in secondary school. Children’s accumulated personal experience, social and other abilities are too poor to enable them find out and perceive complicated nature phenomena on their own (e.g. a child can’t understand why it is getting dark quicker in the forest; why a broken/cut tree can’t grow again and so on). Pedagogue has to become a helper in child’s way to cognition – not to answer the questions, but help him find correct answers to the questions he is concerned about (Kisieliūtė, 2002). So, the strengthening of natural science process in primary school is a very important trend of improvement. This requires methodological support for teachers organizing constant professional development in this sphere. It is also clear that children are interested in the science classes when the content of the taught material is comprehensible, attracts attention and imagination, encourages to intensively work and is problematic (Lamanauskas, 2003).

It is worth emphasizing, that world cognition is not only the course realizing natural science – social education. It comprises ecological, environmental, healthy way of living and other components as well. Generally speaking, the question is how to integrate effectively harmonious development ideas into educational process. Here, again didactic assistance is necessary for teachers, especially those, who are interested in this sphere, are accumulating experience and trying to convey it to others. As an example we can mention the experience of teacher R. Ragaliauskienė (2004). The author shares methodical experience of how to develop environmentally friendly way of living, how to form value standards at school, providing knowledge on ecological and environmental issues, developing abilities and skills in this sphere.

I’d think that an actual question is of taking over and sequence. In this editorial there are no possibilities to analyze these problems in detail however, it is necessary to pay attention to them. We have already mentioned that natural science education in primary school is only one segment in child’s life, in the formation of his personality, in the structure of education formation. Obviously children bring some kind of natural science education from their family and pre-school education institution. This is an important foundation for further growth of this sphere of education. The question which is more and more frequently formed by psychologists is as follows: is the child coming to the first class of primary school not already tired of teaching? In other words, does pre-school teaching not duplicate school teaching? According to the latest researches, the problem of taking over is very important. If cognitive, creative and relation components are joined into entire system one can speak about effective natural science education process and its taking over in the system “pre-school education institution – primary school” (Anikudimova, 2004). Moreover, natural science education in primary school shouldn’t be fragmentary, though in many aspects it is exactly like that in nowadays Lithuanian primary school. As a problem example can be given that frequently life and development questions of living organisms are analyzed separately from physicochemical environment factors and also from physicochemical processes going on inside these organisms.

It is obvious, in order to understand the peculiarities of natural science education working with junior pupils exhaustive researches are necessary and natural science education in primary school has to be modeled, corrected and developed on their basis (Lamanauskas, 2005). Only high-quality natural science education acquired in primary school can guarantee proper continuation of natural science education in basic and secondary school.

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