

# THE COMMON GOAL OF ALL EDUCATORS: HOW TO IMPROVE SCIENCE AND TECHNOLOGY EDUCATION

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*Dear Readers!*

Science education is an integral phenomenon that can be grasped as a whole science. Science education plays a very important role in broadening pupils' world outlook. The science classes always discuss real, concrete things and phenomena, which are a part of pupils' reality and even every day life. It is very important that natural sciences should help learners to formulate a clear concept of natural history based on the latest knowledge of the world strongly emphasizing the character of the correlation between nature and society, civilization and culture. The world is multidimensional, and therefore we must strive to acknowledge it. This is a winning goal of contemporary science education (Lamanuskas, 2003).

Science education is playing a crucial role in both developed and developing countries. Quality-based natural science education is necessary for every human living in a modern world. Different investigations show that natural sciences have lost their previous attractiveness in the developed countries. On the contrary, the young generation of the developing countries most frequently has a positive interest in natural sciences. On the other hand, in most of the cases, natural science education in comprehensive school is not popular, inexactly corresponds to the curricula and has no relevance to the learners' needs. The introduced situation is determined by several common and uncommon factors. The process of natural science education in comprehensive school is one of those not adequate for the present day and achievements in sciences. Such inadequacy first of all, has relation with competence of teachers of natural sciences. Insufficient competence is frequently determined by the inappropriate process of studies in universities training prospective teachers of natural sciences.

Another main point is connected with the whole public, not only with young people, but also with adults. Public natural science education (sophistication) is a burning question. Apparently, natural science education is crucial for training the present young generation. In this case, there is no difference whether a young person will be engaged in natural sciences in the future. The increase of interest of those not involved in sciences or having a previously formed negative attitude towards the subjects is a more complicated problem to be solved. This is concern and obligation of the whole scientific pedagogical society working in the field of natural science education.

Generally speaking, all spheres of science education are important in our modern, technologically oriented society. It is impossible to discuss all pressing questions of science education here. However, I can notice that some trends raise a lot of doubts. For example, the great majority of works are linked to motivation, interests, attitudes and so on. We can't assert that this is not important. In fact, this is the sphere of psychology. How difficult it were to find out the reasons for low interest to science and technologies, the fallen prestige of sciences in comprehensive schools, still they are not essential things from

the educational point of view. All the more, inquiry based researches give only a panoramic view of the situation, i.e. have a stated character. It is completely not clear or almost not clear what causes such a situation. The main goal of educators is to change, develop teaching-learning process using educational devices. Some last researches revealed that pupils understand the meaning of sciences and technologies to society in general, but they are not satisfied with school science. The main question till now is why? It is obvious, that we come in touch with deeper didactic problems here, for example, the content of teaching, teaching-learning methods, teacher and pupils relations, scientific research activity (the latter is a very important part of the whole science education process), at last, teaching-learning process management in general. If we concentrate only on psychological parameters (interests, motives, demands, attitudes and so on), essential didactic parameters remain outside. In other words, the essential question – effective pedagogization of the whole science and technological education process hasn't been solved yet (it considerably deviated towards psychologization and sociologization). Researches of a stated character are not sufficient to reach this. In recent years not only in Lithuania but also in academic societies of other countries, it has generally become a norm to carry out different stated (diagnostic) researches. Very rarely researchers try their ideas and theories in practice. Simply there are no possibilities for this. Then, researchers go along the road treaded by sociologists and psychologists i.e., give questionnaires, tests to pupils, students, pedagogues, only strengthening existing educational practice by this (Bitinas, 2006). Thus, there is one more open question how to rationally change existing educational practice in the direction of development. How to achieve that educational researches were much more effective in the practical applicability of their results? As an example we can mention international ROSE (The Relevance of Science Education) research (<http://www.ils.uio.no/english/rose/>). Countries having participated in the research carried out exhaustive analysis of the results. Different attitude, interest, motive and other differences and similarities in the population of the 15 – year old students were discovered. Without any doubt, it is important. However, these results don't have direct influence on educational practice and on the changes of this practice, of course. On the contrary, quite often- different changes occur rather spontaneously.

Another important thing is the role of ICT in education in general and particularly in science education. It is worth emphasizing, that in recent years, a general degree of integrating ICT in the process of teaching has increased in Lithuania as well as in other countries. The growth is characteristic not only at university level but also at other levels of the education system. It is accepted that ICT makes the process of teaching/learning more effective and beneficial whereas the education system starts functioning faster. The development of ICT and the process of globalization determine alteration in the education system as well as in the whole society. The implementation of new technologies in the educational process raises new possibilities for both teacher and learner, enhances education quality and makes the educational process more versatile.

Therefore, technologies should not alienate from human being and reality. We should devote all our efforts to stimulating youth interest in science and technologies and to reinforcing scientific-technological education at all levels. Although hardly anyone suspects that technologies are having a growing impact on our daily life, however, they still remain alienated from the major part of society members and policy makers and what is more, frequently stand outside the door of the education system. Hence, opening the door is the obligation of all of us. We should discuss and try to solve all key problems really using the ICT in everyday school activities. This is not an easy task. ICT is not as panacea for solving all educational problems. As I have already mentioned, modern ICT definitely play a crucial role in developing the teaching/learning processes at all stages and improving the quality of education. Educational advantages of ICT raise no doubts.

One of the most important requirements for applying ICT and innovative techniques of teaching is a qualified teacher able to professionally use technologies in practice. A modern teacher must know how to employ ICT and adapt them in order to achieve specific goals of teaching. Today we can observe paradoxical situation. In the majority of cases, students' computer literacy remains higher than that of their teachers. Nevertheless, teachers' computer literacy becomes an essential professional work condition. ICT application in teaching/learning process shouldn't be an end in itself. The essential thing is how to achieve that ICT application increased teaching effectiveness, enriched the work of teachers and pupils.

Another important thing follows, that it is not enough to use only computers. It is understandable that the majority of modern ICT in one way or another are related to computers. However, not analyzing ICT classification nuances we can notice that ICT variety is necessary to guarantee teaching effectiveness. Not for one country the question arises how to find financial recourses to guarantee such variety. It is obvious, that not the quantity but the variety of technologies is this crucial factor. For example, in the schools of Great Britain active boards are almost in every classroom. "Active boards" are with the software different for primary and secondary schools; "Smart boards" are spread more in the classes and schools of junior and disabled pupils. It is obvious, that constant pedagogues' interest in the newest ICT is necessary, on the one hand and formation of suitable conditions in schools, on the other hand. It is without doubt, that teacher's pedagogic competence, his ability and interest to use ICT are closely related. The situation in Lithuania comparing with other European countries is not exceptional. For example, in 2006/2007 only 49% of teachers were using ICT for teaching their subject. In 2008/2009 their part increased up to 67% (Masaitis, 2009).

On the other hand, we have different students at school. Their capabilities are so different. This means that modern teaching and learning combines different approaches. It is called "blended learning". Generally speaking, it should be carefully considered because of possible negative outcomes of applying these technologies. Thus, the question of the negative impact of ICT is gaining more weight. It seems no answers are required. On the other hand, we are still suffering from shortage of information on different aspects having negative impact. When the answer is clear, we start feeling lack of required abilities and knowledge of how to reduce the negative impact of ICT or how to eliminate or at least minimize it. Another important issue is what the real impact of modernization on society in terms of ICT implementation is.

Finally, some words about international cooperation. It is undoubtedly an important issue. I cannot imagine nowadays scientific research or scientific activity in general without international cooperation. Science is science and it has international character. Moreover, such cooperation is crucially important for scientists from former Soviet Union countries, because they had no possibility to communicate with colleagues from abroad or such cooperation was strongly limited. Another argument is that science education today is the most dynamic part of the science of education (Toshev, 2008). It is obvious, if we want to obtain the necessary scientific information about different things, to enlarge technological possibilities of societies and so on, generally speaking, to make our world more safe and better, international cooperation among scientists is essential. Only all together we will be able to meet a broad range of global challenges today and tomorrow.

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