Involving Pupils in Geoscientific Researches: Russian Experience

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Nowadays a huge gap between real geoscience and geoscientific activity and its representation in school curriculum exists. It hampers adequate understanding of science in society and occupational choice by pupils. One of the ways to shrink this gap is the involvement of pupils in geoscientific activity. Russia has very long tradition for it, which continues since 1960s and remains despite all the perturbations of the last two decades.

There are two sides providing involvement. On the one hand, it is academic or university researches, which need operatives for their expeditions and, in prospect – good students. On the other hand it is good schools and institutions for supplementary education. Sometimes universities themselves organize study groups to involve pupils. The collaboration between schools and institutions is usually based on personal contacts between teachers and researchers. Very often the participation of pupils in scientific expeditions is paid out not by research team, but by educational authorities, because they have funds for providing outdoor activity.

What pupils can do for science? First of all, we should point out the following. The majority of the pupils can not formulate and solve real scientific task by themselves – even the most smart pupils are not qualified for it. Moreover, the seldom understand the context of the scientific problem that their team works on and can interpret their own results – the interpretation is usually given by scientists in the team. However, pupils are capable to understand explanations of their results, given by the scientists in the team. Hence, pupils can carry out technical or routine work. If they are qualified in some branch of activity (for example, in programming, species identification or something like that) they can do this work too. Measuring methane emission from swamps in many stations, inventory nesting sites, measuring oxygen in water, describing species of – these are the examples of work, really fulfilled by pupils.

When one or two pupils take part in the expedition, they could report to some of the scientists. However if there are 4 or more pupils, it should be a separate team leading by experienced teacher, who understands the scientific task and organizes their activity. Professional scientists often fail overestimate the qualification of the pupils and fail in controlling them.

Pupils understand, that their activity is a part of big scientific job and do not worry if they don't see the problem in a whole. Therefore, the scientific result is not the main motivation for them. Money don't motivate them too – the salary usually is ridiculous. What is the motivation?

We would say, that the main reasons for participating in expeditions are (a) interest to something new; (b) communicating; (c) overcoming challenges; (d) aesthetic feelings. So, the majority of the reasons are not rational. The following conditions to attract pupils should be underlined.

The work should be outdoors – the outdoor activity, especially in untouched or beautiful places, is very attractive to many pupils. Hard conditions (for example, living in tents among mosquitoes or long passages across the rugged area) are also attractive – peoples are proud that they overcame it. The task should fit the qualification of a pupil: it should be relatively new, but understandable and feasible. Besides the work, the psychological climate is essential. It is the subtlest feature of any expedition: the "cordiality" is very often the main argument for or against joining this company for the next year.

In the accelerated classes of our school more than 2/3 of all the pupils have participated in geoscience activity and usually enjoy it. The same situation is in other accelerated schools and supplementary institutions. Many of them did not become scientists. However, they keep positive attitude to science and critical thinking..