Beáta Jarosievitz Dr.: Opportunities of Information Technology and Multimedia in Education

(abstract)

Ph.D. study
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The popularity of natural sciences and techniques as well as interest in those fields have declined in the schools world wide from year to year – as reflected by research of pedagogy. The world of the 21st century however can not be understood without a basic knowledge of natural sciences.

In the first part of the thesis the students' attitude to physics, motivation and IT knowledge are assessed by a questionnaire through 9 hypothesis. (17 schools in Hungary and 2 abroad have replied to the questionnaire. As a result of the survey it has become clear that we have to make physics classes more colourful and interesting if it is our intention to let our students leave the secondary school with high level and applicable skills of physics and an advanced knowledge of natural sciences. To turn classes more interesting it is necessary to take advantage of the opportunities offered by IT and multimedia. In this process it is highly significant to use an interdisciplinary approach. To reach the target is not easy but it is possible by applying complex methods.

In the second part of the thesis in addition to the study of the questionnaire the author makes a recommendation to change the attitude and broaden the approach of the students. As a practicing teacher the author has introduced the application and study of the project method as a qualitative method of pedagogy, as action research in her scientific activity. The method is complex enough to efficiently mobilize masses of students to meaningful learning and help them acquire knowledge that they can use effectively. In the thesis three projects are described. The author actively took a leading part in the planning and organization of those. (The Solar constant measurement, Observation of the Venus transit, The Day of Physics in our school.)

The project method is portrayed in the thesis in its broader context. It could be a promising asset to modernize the teaching of physics and make natural sciences more attractive by engaging multimedia and Internet communication. Both students and teachers involved were very enthusiastic about the projects.

The Solar constant measurement emphasized international communication, the deepening of international cooperation and application of complex knowledge (preparation of a tool for measurement, measuring, interpretation).

The Venus transit project could be called as a classical one because the attention of the students, teachers and society is called on a specific event that can be observed. By a conscious observation of the transit we directed the attention of students and people in general on the subject and communicated additional information by multimedia presentation to make it more popular.

The third project, the Day of Physics in our School was held as part of our school's internal life. Experimenting on their own, groups of enthusiastic students made physics more popular. Thanks to their activity the students' attitude to physics has improved in the school.

With the help of the innovation – the attitude improving projects – we have come closer to the goal of having student who are autonomous, have a creative way of thinking and by integrating their experimental, theoretical, mathematical and IT skills are able to have proficiency of knowledge that is universal and useful.