The influence of **ICT** on students´ **motivation** towards **Physics**

Number of students who selected Physics as optional course in the school years 2006/2007 to 2010/2011 fluctuated between 0-13 students which represented 0% to 7% of the whole relevant student body. Physics as graduation course was selected by 1-13 students which represented 1% to 7% of the whole relevant student body.

Hypothesis 1

If we implement ICT and interactive teaching methods efficiently, then we achieve change in student interest in Physics.

Tool

Pedagogical experiment using ICT and interactive methods efficiently starting school year 2009/2010 to verify hypothesis 1

Hypothesis 2

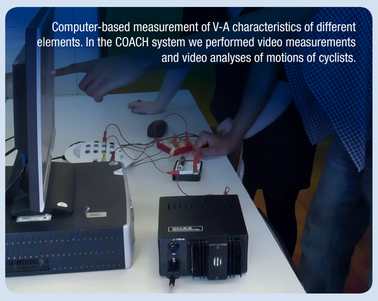
If we achieve change in student interest in Physics, then it results in an increased number of students selecting Physics as optional and graduation course.

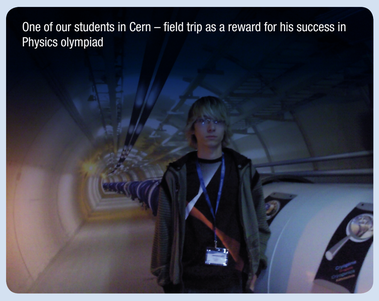
Tool

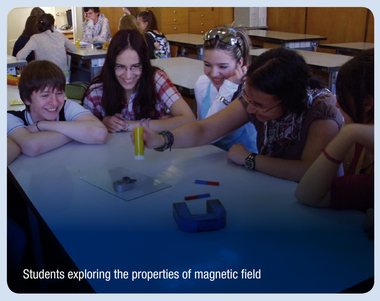
Questionnaire in the run of the school year 2010/2011 to verify hypothesis 2.

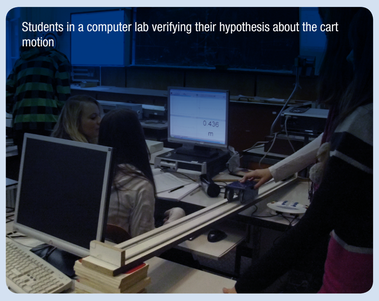
PEDAGOGICAL EXPERIMENT (HYPOTHESIS 1)

The experiment started in September 2009 in the 1st grade Physics courses by implementing interactive teaching methods enhanced by a wide variety of ICT in order to verify the hypotheses.

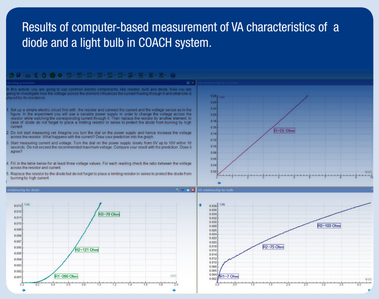

Computer-based measurement of V-A characteristics of different elements. In the COACH system we performed video measurements and video analyses of motions of cyclists.

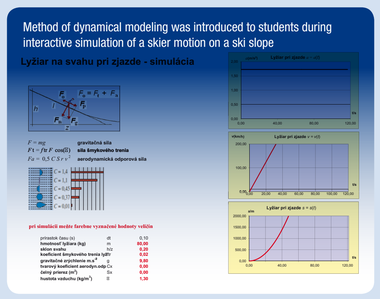

One of our students in Cern – field trip as a reward for his success in Physics olympiad

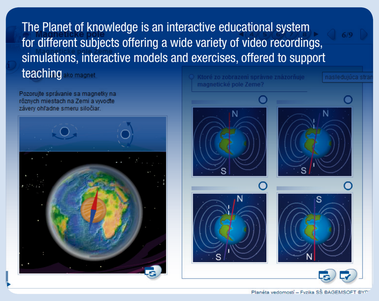

Students exploring the properties of magnetic field


Students in a computer lab verifying their hypothesis about the cart motion


Presentations about the research in Cern, its goals and work as well as about the development of the Universe and the Solar system.


Results of computer-based measurement of VA characteristics of a diode and a light bulb in COACH system.



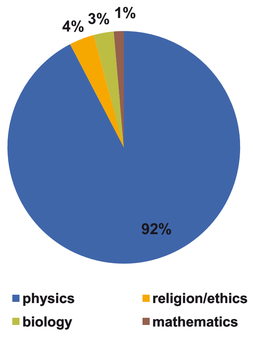


RESEARCH QUESTIONNAIRE (HYPOTHESIS 2)

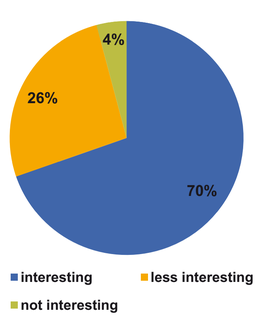
From November 22nd until December 2nd 2010 we administered a research questionnaire in order to verify the hypotheses. The questionnaire consisted of 9 multiple choice questions and was submitted by 145 students taking part in the experiment out of which 99 were girls (68,3 %) and 46 were boys (31,7%).

Interactive teaching methods enhanced by ICT are used in Physics course to their greatest extent compared to other courses and they helped increase the interest of students in Physics which verifies hypothesis 1.

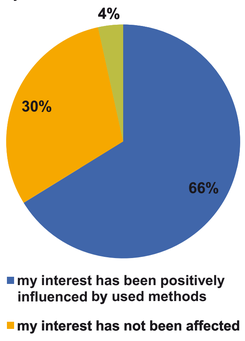
In which course interactive teaching methods and ICT are used the most?



Is Physics course interesting for you?

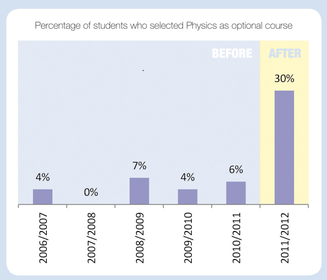


Have interactive teaching methods enhanced by ICT increased your interest in Physics?

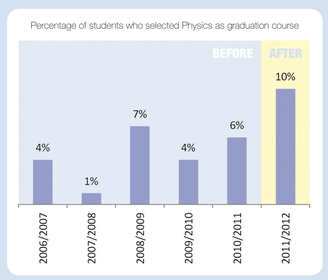


RESULTS

Changed interest in Physics resulted in increased interest in Physics as optional and graduation course. When making the decision the students were positively influenced by the fact that modern teaching methods were used which verifies hypothesis 2.



44 students out of 145, selected Physics as optional course



15 students selected Physics as graduation course compared to 1-13 students in the previous years.

CONCLUSIONS AND RECOMMENDATIONS

- The experiment has proven that interactive methods enhanced by ICT are an efficient tool to increase student interest in a Physics course.
- The results demonstrate how important it is for teachers to educate themselves continuously in the area of modern teaching methods and use them in the class.
- Implementation of ICT into education process and efficient usage of interactive methods has helped create a big pool of students who will study Physics not as a mandatory course but solely based on their own interest.
- This work may well become a manual for teachers at other schools.

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ABSTRACT:
In Slovakia we are currently facing decreasing interest towards science and physics, in particular. This fact results in low number of students who decide to take physics as an optional subject offered by the school curriculum at secondary level and as a consequence there is a decreasing number of students who want and are able to study sciences and polytechnical branches. The study analyzes the situation at one of the prestigious grammar school in Košice, Slovakia. It describes a pedagogical research aimed at the implementation of interactive methods enhanced by ICT and its influence on students´ motivation towards physics. There was a number of different ICT applied in teaching (computer-based experiments and measurements, simulations and virtual experimentation, video analysis, modeling, students´ independent projects enhanced by ICT). However, it was not about ICT itself. The strong emphasis was put on the interactive methods used in the class. Within the pedagogical research that was running during two school years the hypothesis concerning the influence on students´ motivation towards physics was tested and verified. In the contribution there are the results of the research presented, analyzed and discussed.

SECONDARY GRAMMAR SCHOOL

Between 1892 and 1896, a new elegant style building was erected in Šrobarova street – the building of the State Girl High School. In 1896 the school had 236 students. After the fall of the Austro-Hungarian empire, the government of Czechoslovakia altered the school into college-preparatory high school.Currently, our school has 21 classes and around 600 students. In their free time, depending on their interests,

students work in different clubs, e.g. physics club, biology and chemistry Olympiad club, language clubs, the tourism and environmental club, sports clubs, etc. Our school has a staff of university-educated teachers as well as lecturers from the United States and Germany. Many students spend a part of the school year at schools abroad. Approximately 98% of our alumni continue their studies at universities both in the Slovak republic and at universities around the world such as Harvard or Oxford University. *(You will find more at www.srobarka.sk)*

REFERENCES:

National project Modernization of education process at secondary grammar schools, available at https://www.modernizaciavzdelavania.sk

Koubek V. et al. (2009), Physics for the 1st grade of secondary grammar schools, p. 151

Digital curriculum Planet of Knowledge, Secondary grammar school Physics, Magnetic field, available at http://lms.planetavedomosti.sk

Interactive simulations. Physics. Electricity, magnets, Circuits, available at http://phet.colorado.edu

COACH system, available at http://cma-science.nl/english/