World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:11, No:08, 2017

High School Stem Curriculum and Example of Laboratory Work That Shows How Microcomputers Can Help in Understanding of Physical Concepts

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Abstract : We are witnessing the rapid development of technologies that change the world around us. However, curriculums and teaching processes are often slow to adapt to the change; it takes time, money and expertise to implement technology in the classroom. Therefore, the University of Split, Croatia, partnered with local school Marko Marulić High School and created the project "Modern competence in modern high schools" as part of which five different curriculums for STEM areas were developed. One of the curriculums involves combining information technology with physics. The main idea was to teach students how to use different circuits and microcomputers to explore nature and physical phenomena. As a result, using electrical circuits, students are able to recreate in the classroom the phenomena that they observe every day in their environment. So far, high school students had very little opportunity to perform experiments independently, and especially, those physics experiment did not involve ICT. Therefore, this project has a great importance, because the students will finally get a chance to develop themselves in accordance to modern technologies. This paper presents some new methods of teaching physics that will help students to develop experimental skills through the study of deterministic nature of physical laws. Students will learn how to formulate hypotheses, model physical problems using the electronic circuits and evaluate their results. While doing that, they will also acquire useful problem solving skills.

Keywords : ICT in physics, curriculum, laboratory activities, STEM (science, technology, engineering, mathematics)
Conference Title : ICETI 2017 : International Conference on Education and Teaching Innovation
Conference Location : New York, United States
Conference Dates : August 07-08, 2017