Conference 6

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The Internet of things, mobile devices and the promising future for Science Education

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The advancement of the new technologies of information and communication brought significant contributions to science education. Beyond, the fast pace of introduction of new technologies in research laboratories creates the need for their timely introduction in classrooms. Unfortunately, in most cases there is a large time gap between the widespread adoption of new research technologies and their availability to students in regular courses. A remarkable case was the dissemination of personal computers that brought many benefits to science education. Computers have made information from diverse and far away sources promptly available to students and lecturers, in the classroom, teaching labs and home. Some examples of the benefits brought by personal computers to science education are the possibility of interaction with models and their development, the capacity of data storage, treatment, exchange and visualization as well as the possibility of simulation of complex systems. The capacity of having things (instruments, equipment, sensors, actuators) connected to the internet opened a unique perspective for science education that is the possibility of massively teaching science by doing science. Experiments can be planned and data can be collected and interpreted remotely, using personal devices and equipment that can be made available to students for remote operation, from their schools. This talk will presents examples and possibilities of science teaching by doing science mediated by the internet of things: interdisciplinary activities were developed for primary school students, allowing them to observe samples collected by themselves or made available by their teachers, using remote microscopes. The students are thus prompted to go deeper into the study subject, discussing their results in a broader context. This setup also allows students to manipulate variables in a controllable environment and to collect data from remote sensors, doing sophisticated analyses of their samples.

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