

Modernization of the Physics Laboratory by using HP Mobile Technology

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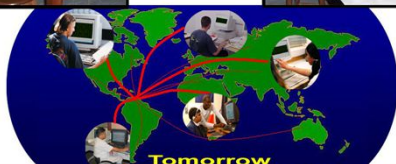
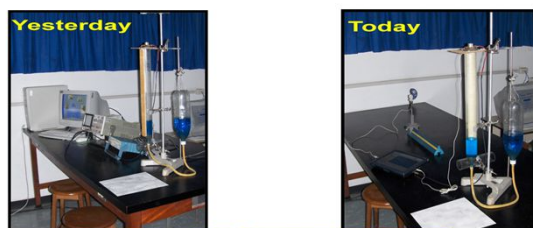
J. Bastardo, C. Osorio, H. Barros, E. D. Greaves,

G. Villegas, L. Sajo-Bohus and J. Ruiz.

<http://www.nuclear.fis.usb.ve/HP0.htm>



This new Project is based on exploiting all the benefits of the HP mobile technology to modernize the Physics Laboratories at the Simon Bolivar University. By this we will reduce the time spend on each experiment, so the students will be able to pay more attention to the physical phenomenon rather to the difficulties associated to the measurements. The project will enrich the minds of 1500 students (per year) with the uses of the new technology, and at the same time they will get not just better results, but a better understanding of the Physics.



Impact on Student Learning

In the past the students had to work with many devices and had to manipulate data with old fashioned PCs, spending a lot of time typing down the results of each measurement, focusing on compiling the numbers. **Now**, the portable HP Tablet-PC replaces some of the old devices used before and are in charge of compiling all the data (manually or electronically) and process it in a faster and easier way. It will leave more time for the analysis and understanding. All this results in improvement of the learning process, particularly in the experimental physics. **Later on**, in the coming years, this project will expand, using the wireless remote connection to create virtual classrooms that can be visited in real time by everybody around the world via internet.

Technology Implementation

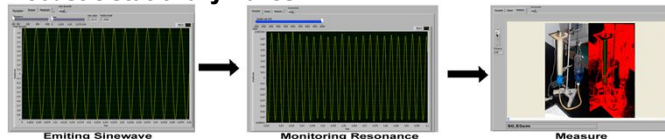
This technology is used in several experiments to compile data. So, students will have more time for the analysis and will obtain better conclusions. At the same time, teachers will get students dedicated entirely on understanding the experiments and analyzing the results. In other words the HP tablet-PC will be used as a complete tool for teaching/learning science, particularly, experimental physics. In some experiments the PCs are replacing some old devices (oscilloscopes and function generators), and it also show graphically in real time the phenomenon by using different kind of sensors (microphones, webcams, etc.). All the required software was developed by advanced students using a visual programming language.

Impact on Teaching

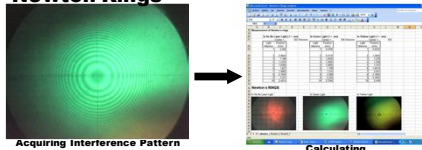
Before the project the students had to deal with some difficulties inherent to the experiments. For instance the counting and measurement of thin interference lines through a microscope or the hearing of a stationary acoustic wave resonance. Now we are using the same topics and experiments but considerably improved by the use of the HP technology which reduce the difficulties. Therefore the student's reports will show deeper analysis and more mature concepts. Success will be the exploitation of all the advantages of this new technology: portable, easy to use, substitution of old fashion devices, obtaining more information, obtaining better data, simplifying procedures.

All this make the teachers get the point easier and more straight forward, being allowed to show and explain the phenomenon with more resources.

Acoustic stationary waves



Newton Rings



Keywords: Science, Experimental Physics

