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Assessment of Virtual Experiments on Students' Achievements and Attitudes Toward Physics Learning in Upper Secondary Levels

The purpose of the research is to compare students'achievements and to study attitudes toward physics learning in Upper Secondary levels before and after being treated by Virtual Experiments (VEs) and the efficiency of VEs. The hypothesis of the research is that students'achievements and attitudes toward physics learning will be improved significantly after VEs are treated. The quasi-experimental procedure, specifically, One-Group Pretest-Posttest Design, was used in the research and the purposive sampling technique was employed to select schools and students. The research was separated into two phases. In the first phase, VEs were treated on and the data was collected from 176 students in 6 schools governed by the Education Department of Bangkok Archdiocese (EDBA) in academic year 2014. For the second phase, the data was collected from 437 students in 12 national schools in academic year 2015. The achievement tests and questionnaires were used as research instruments. The research hypothesis was tested by dependent t-test statistic. Descriptive data was analyzed by using mean and standard deviation while qualitative data was analyzed by using the content analysis method. The result shows that after being treated by VEs, achievements of students increase significantly by 0.1; however, attitudes of students toward physics learning decrease insignificantly. Students'satisfaction toward VE is quite moderate while comments from students imply that they are able to understand physics concepts better after using VEs. For the overall efficiency, VEs exhibit stable performances.

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