

## Hybrid problem based learning games for effective mathematics learning

### ABSTRACT

Poor mathematics achievement is a critical issue that has been discussed lately. The combination of Problem Based Learning (PBL) method and game in mathematic environment can be synchronized to help students mastering mathematic knowledge heuristically. The objective of the study is to explore the effectiveness of using PBL and educational games in enhancing Mathematics learning. The experiment was carried out for three weeks involving 50 randomly selected Year 2 Engineering students who enrolled into Engineering Mathematics 2 course. The experimental group (EG) was exposed to PBL and Educational Game instruction whereas the control group (CG) was taught conventionally. There are three set of instruments used in this study namely PBLMathGame courseware, pre-test and post-test questions, and rubric sheets. The data were analyzed using independent t-test. Results indicated that the use of PBL positively increases students' achievement and added value of game to PBL learning enhanced students' skills in problem solving. It is recommendable in the future on the development of advanced game resources or games bank for the inclusion of many topics on mathematics learning.

**Keyword:** Problem based learning; Educational games; Mathematics learning; Calculus; Student centered learning