

## ABSTRACT

Research Title: Using Programmed Instruction\_Laboratory Approach (PI\_Lab) to  
Study English for Geometrical Communication

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The purpose of this research was to develop a Programmed Instruction\_Laboratory (PI\_Lab) for mathematics teachers on geometry strand in grade 7 at International College Summer Workshop 2012. The samples in this study were 40 mathematics teachers from the schools in Bangkok and suburbs under the Office of the Basic Education Commission of Thailand and under the Education Bureau of Bangkok Metropolitan who registered this workshop by cluster sampling from 54 mathematics teachers registered in the workshop. The experiment was conducted as the following objectives: 1) To test the efficiency of PI\_Lab lessons based on the criterion 90/90; 2) To determine the mathematics teacher's achievement gained from studying PI\_Lab by using t-test; and 3) To assess the mathematics teacher's knowledge retention after the end of studying PI\_Lab in seven days and 30 days by using the retention value between 75 percents and 90 percents.

The results of this research study have found that the PI\_Lab had efficiency 90.9/ 92.5 attaining above 90/90 criterion. The mathematics teacher's learning achievement was significant at  $\alpha = 0.05$  and the mathematics teacher had knowledge retention between 88.61% and 81.23%