To Enhance Learning Effectiveness of Computational Thinking by Developing a New Board Game with Problem-Solving Strategy

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Abstract
Computational thinking is a new problem-solving strategy that can be used in any field, including problems in life, so that everyone can focus on important things while ignoring small details that are not important. By using computational thinking mode, the problem can be solved more efficiently. Therefore, in recent years, computing thinking has been valued by countries and incorporated into the curriculum of national education. In addition, educational and entertaining, the rapid development of board games in recent years has been widely used in a variety of learning activities. Many studies have also found that board games can enhance students' concentration. Therefore, this paper developed a game-based learning activity suitable for improving the computational thinking ability of students, which has the characteristics of unplugged and also integrated into some programming concepts. Our proposed board game can allow students to easily learn a variety of strategies for solving problems in the game, and thus enhance their ability of computational thinking. This research simulated a brand new table top game, design a board game activity that fits computation thinking. Using Quasi-Experimental Design, took 65 children from an elementary school in Tainan for experiment. The test group contents 28 people, interact by table top game way; the control group contents 28, using Scratch game design education. The results show that students who received unplugged table top game improve their computation thinking the most. Besides, though the control group didn’t reach the standard of the former, the pro-test score is higher than the test group, it is a good behave to still improve in the post-test.

Key Words: Computational Thinking, Board Game, Learning Effectiveness
JEL Classification: C 19, G13, G 14