Effects of Type of Learning Approach on Novices' Motivation, Flow, and Performance in Game-Based Learning

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Abstract. This study employed a quasi-experimental design to examine the effects of learning approach on learners' motivation, flow experience and performance. The research framework consisted of pedagogy, content and technology aspects. For the pedagogy aspect, type of learning approach was employed to engage the learner in game-based learning. For the content aspect, the game-play activity was conducted to enrich the learner in understanding programming concepts. The content includes the programming concepts, variables and control structure. For the technology aspect, the game design tool, *Scratch*, was employed to empower the learner in trial-and-error practice to express the ideas they acquired. The instruments utilized in the present study were *motivation questionnaire, flow experience questionnaire,* and *project grading rubrics*.

The experiment was conducted in a 7-week session of learning basic programming concepts. The experiment includes two phases, the game-play and game design phase. The active exploration approach employed game-play of *Flash* games first. After that, learning activities on programming concepts using *Scratch* were provided for learners to practice their acquired knowledge and concepts. In contrast, the tutorial approach employed learning activities on programming concepts using *Scratch* first. Then game-play of *Flash* games were employed and served as an application context for learners to enhance their acquired knowledge and concepts. The difference between the active exploration group and tutorial group were the sequence of game-play, game design activity and the support strategy. The active exploration group received the metaphors during the game play activity to facilitate the understanding of programming concepts, while the tutorial group received the demonstration.

The results showed that (1) those learners who received active exploration possessed higher learning motivation and flow experience than those learners who received tutorial activity, (2) performance on the project for learners from both learning activities was the same, and (3) game-based learning could engage the learner with higher motivation and flow experience in programming learning.

Keywords: game-based learning, motivation, flow experience, programming concept.

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