

Students' Algebraic Thinking and Attitudes towards Algebra: The Effects of Game-Based Learning using Dragonbox 12 + App

Abstract

The language of algebra promotes thinking about pattern recognition and analysis, problem-solving and reasoning skills, and generalising arithmetic operations through representation with symbols. However, the high level of abstraction in algebra can cause difficulty for some students. Students who have problems learning algebra tend to show less positive attitudes toward algebra. Therefore, this study aimed to examine the effects of an android app, the DragonBox 12+, on algebraic thinking and attitudes toward algebra among eighth grade students. By using a quasi-experimental approach, comparison was made between an experimental group ($n = 30$) and a control group ($n = 30$). The instruments used were a pre-post test to test algebraic thinking and a Fennema-Sherman questionnaire to measure student's attitudes toward algebra. Results revealed that students who learned algebra using the DragonBox 12+ showed significantly higher mean scores in algebraic thinking and attitudes toward algebra compared to the control group. Findings suggested that DragonBox 12+ can provide insights into the support required for mathematics teachers to adopt effective game-based learning for teaching algebra in their schools.