

Investigation of the impacts on students using current and future game-based learning in different programming languages: A review

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Abstract of the Study:

The focus of engineering education research has significantly shifted over the past five years from teacher-centered pedagogy to a learner-centered strategy. Due to its emphasis on "hands-on" and "minds-on" activities in programming courses, game-based learning has become one of the most advantageous teaching methodologies. However, there haven't been many review studies in engineering education research that have tried to track down the many educational games used and how they have aided in improving students' enthusiasm and comprehension of programming concepts. To fill this gap, sixty-five papers in all were reviewed for examples of instructional games developed between 2017 and 2022 in various programming languages. All the reviewed publications were acquired from different scientific research journals. For all the papers that were investigated, a systematic analysis was used to determine the objectives, game-based learning strategies in engineering education, and its effectiveness in programming languages. The findings demonstrate that game-based learning improves students' conceptual knowledge of various programming languages and increases their drive to learn and enjoy themselves while making sense of the material studied. It was discovered that game-based learning was employed more frequently in secondary and tertiary institutions than in elementary schools. Even though young children enjoy playing games, when they are utilized to teaching, things are different. Students in secondary and higher education are more mature and capable of learning through play seriously as opposed to just having fun than those in elementary school. This is a positive result, but since there is no specific program or set of modules that is ideal for the game-based learning strategy, game developers and kids' aptitude or attitude should take this into consideration along with other potential future study topics.

Keywords: game-based learning, gamification, educational games, programming languages, engineering education, digital learning

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