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# Application of the Educational Game to Enhance Student Learning

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The purpose of this study is to investigate the use of an educational game to enhance student learning effectiveness. This study consisted of 56 college students majoring in physical education and recreation management (32 men, 24 women, age *M* = 21 years, *SD* = 1.72). Students used the educational computer game “PaGamO” to study the motor learning and development course. Students received rewards based on their individual and group “PaGamO” scores. Regression analysis indicated that “PaGamO” score was a significant (*p* < 0.01) predictor of multiple choice (MC) score in the final examination, there was a medium positive correlation (β = 0.354). The *R*2 suggests that 12.6% of MC score was explained by “PaGamO” score. Quantitative and qualitative mixed-method approach was used to gain insights into students’ perceptions and experiences of the educational game. The top three statements of a modified questionnaire from [Riemer and Schrader (2015)](https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full#B38) are: (1) “*In my opinion, the use of ‘PaGamO’ enables me to better prepare for the final examination*” (*M* = *5.04, SD* = *1.41*), (2) “*In my opinion, the use of ‘PaGamO’ enables me to understand learning contents*” (*M* = *4.8, SD* = *1.19*), (3) “*In my opinion, the use of ‘PaGamO’ allows me to apply knowledge*” (*M* = *4.75, SD* = *1.08*). The top three motives to play “PaGamO” were “fun,” “self-learning,” and “want to get a higher grade in the final examination.” By using gamification as a tool for learning and studying, students did find “PaGamO” effective for their learning experience. Both intrinsic and extrinsic participation motives are reasons why students play “PaGamO.” Furthermore, due to its convenience, using mobile devices to play “PaGamO” is more popular than using computers and tablet devices. In conclusion, the combination of gamification and traditional learning methods can enhance students’ learning outcomes.

## Introduction

Gamification in education has become the focus of attention in recent years. While “gamification is the practice of using game design elements, game mechanics and game thinking in non-game activities to motivate participants” ([Al-Azawi et al., 2016](https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full#B2), p. 133), educational gamification is a teaching method that requires learners to participate in competitions according to preset rules ([Fitzgerald, 1997](https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full#B14)). It has been an interdisciplinary and prevalent tool for educators to utilize in teaching in the past few years ([Robson et al., 2016](https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full#B40)). In view of the rapid development of technology, learners may expect teachers/lecturers to employ this tool in lessons/lectures ([Rondon et al., 2013](https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full#B41)). In the field of education, researchers have been eager to find new strategies to enrich students’ learning experiences, especially in this technology-driven world in which educational games are one of them ([Minovic et al., 2012a](https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full#B30)).

### Effectiveness of Educational Games

A systematic literature review had been conducted by [Calderón and Ruiz (2015)](https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full#B5) who found that 53 educational games research literature had adopted different methods to assess the effectiveness of diverse educational games in the period between November 2013 and April 2015, compared to 18 and 20 games used in health and wellness, and the professional learning and training domain, respectively. They also reported that 60% of these 53 studies examined the effectiveness of using educational games in higher education setting, compared to only 40% in primary or secondary school settings, indicating that teachers in higher education are more likely to combine educational games with traditional teaching methods into students’ learning experiences—a sign of creativity of embracing the new strategy to enrich students’ learning experience.