

Gamification in Apps: Driving Student Engagement and Retention

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Abstract

This study will develop a gamification platform to facilitate teaching and learning both inside and outside of the classroom. In this learning platform, teachers will work with University professionals and teachers to develop the *MATHero's Journey* App for various mathematics topics, which will facilitate self-directed learning. The students will have new opportunities to challenge, confirm, or enhance their mathematics knowledge by solving mathematics problems. As many junior secondary level students are not motivated to learn mathematics in Hong Kong, we propose using gamification theory to create a new e-learning app *MATHero's Journey* to help motivate such students. This study applies innovative teaching and learning by adopt e-learning apps to provide greater diversity in teachers' teaching methods and enhance students' academic performance. About 400 students (Form 1 to Form 3) as participants will be included in this study. Students will be invited to participate in experiment and to determine the effectiveness of this gamification approach via *MATHero's Journey* App. All participants will receive a standard mathematics pre-test and post-test during Mathematics lessons, to assess student learning outcomes on *MATHero's Journey* App uses. Finally, at the end of the study, students will complete a survey about their experiences, perceptions, motivations and future plans for using *MATHero's Journey* App. Newly developed mathematics apps significantly enhance learning by increasing engagement through gamification and personalized feedback. They promote accessibility, allowing students to practice anytime, and facilitate a deeper understanding of concepts through interactive features. *MATHero's Journey* App also tracks progress, reducing anxiety and improving retention, ultimately leading to better academic performance in mathematics.