ESCAPE ROOMS AND STUDENTS COMPETENCIES

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ABSTRACT

This paper presents the possible impact of gamification on the acquisition of mathematical competencies in the context of Differential and Integral Calculus. Gamification, the incorporation of game design elements in educational settings, serves as a powerful pedagogical tool to enhance student engagement and motivation. By integrating game mechanics, and challenges into the learning process, this approach aims to create an interactive and stimulating educational environment. The study examines how gamification may facilitate the understanding and application of calculus concepts, promoting critical thinking and mathematical competencies as outlined in Niss's competency framework. In this study, students engage with calculus content through a series of carefully designed game-based activities and assessments. These activities are embedded within a narrative where students are tasked with planning and rebuilding a city devastated by a catastrophe. The primary educational objective is to master integral and differential calculus concepts through this immersive and interactive approach. According to Niss's framework, competencies such as thinking mathematically, problem-solving and posing, modelling, reasoning, use of aids and tools, and communication are expected to be enhanced. The gamified approach also aims to enhance collaborative learning and improve communication among peers, contributing to the development of essential students 'soft skills. This paper proposes gamification as an activity to be integrated into the calculus curriculum since the authors believe that it will not only enhance the acquisition of mathematical knowledge but also support their proficiency in Differential and Integral Calculus. It offers insights into innovative pedagogical approaches for educators.

***K*eywords** Education · Mathematics · Gamification · Competencies · Escape Rooms

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