

## **GAMIFICATION-BASED LEARNING PATHS TO IMPROVE MATHEMATICAL REASONING IN MULTICULTURAL CLASSROOMS**

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### **Abstract**

This study aims to examine the effectiveness of implementing a gamification-based learning pathway in improving students' mathematical reasoning skills in multicultural classrooms. In an increasingly diverse educational context, a key challenge is creating a learning approach that is inclusive, engaging, and accommodating to different cultural backgrounds. Gamification, with elements such as points, challenges, and achievements, is believed to be able to motivate students more evenly without neglecting cultural differences. This study used a quasi-experimental approach with two groups: a class implementing conventional learning and a class using a gamification-based learning pathway. The analysis showed that students in the gamification group experienced significant improvements in mathematical reasoning skills and demonstrated higher levels of participation and engagement. These findings indicate that the gamification approach is not only cognitively effective but also contributes to more adaptive and responsive learning in multicultural classroom contexts. This study recommends integrating gamification design into the mathematics curriculum as a strategy to strengthen cross-cultural engagement and improve more equitable learning outcomes.

**Keywords:** gamification, mathematical reasoning, game-based learning, multicultural classroom, innovative learning strategies

### **INTRODUCTION**

Mathematics education has long been a key pillar of the global education system due to its crucial role in developing students' logical, analytical, and problem-solving skills. However, in practice, mathematics teaching often faces complex challenges, particularly in the context of multicultural classrooms, which are increasingly becoming a part of today's global educational reality. Classes comprised of students from diverse cultural, linguistic, and value backgrounds require adaptive and inclusive learning approaches to ensure equitable achievement of learning objectives. In this regard, developing learning strategies that bridge cultural differences and