BPP – IOER International Multidisciplinary Research Conference
28 - 29 June 2025, Holiday Inn Express Seoul Hongdae, Seoul, South Korea

Enhancing Mathematical Learning through Gamified Strategies: The Framework of Project MATH-LARO (Learning through Active, Responsive, and Organized activities)

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Abstract

Gamified instruction has emerged as an innovative approach in teaching Mathematics, offering a dynamic alternative to traditional methods. This study, anchored on the implementation of Project MATH-LARO (Learning through Active, Responsive, and Organized Gamification), aimed to explore teachers' current strategies, perceptions of gamified activities, and the challenges encountered in applying game-based learning. Specifically, it sought to determine the extent to which gamification influences student engagement, participation, and comprehension as perceived by educators. Using a mixed-methods design, the study involved 50 Mathematics teachers from various public secondary schools. Data were gathered through a researcher-made questionnaire composed of three parts: (I) current teaching strategies, (II) perceptions of gamified instruction across three domains—engagement, participation, and comprehension—and (III) open-ended questions on challenges and recommendations. Quantitative data were analyzed using descriptive statistics, while thematic analysis was applied to qualitative responses. Results showed that while traditional strategies such as lecture-based teaching (92%) and collaborative group work (88%) remained dominant, a significant number (74%) of respondents reported integrating game-based learning in their classes. Teachers strongly agreed that gamified activities increased student engagement (mean = 3.62), encouraged greater participation (mean = 3.58), and improved comprehension of mathematical concepts (mean = 3.67). Qualitative data revealed common challenges, including time constraints, lack of materials, and insufficient training in gamification design. Respondents recommended the development of ready-to-use game templates and professional development workshops. In conclusion, teachers recognized the positive impact of gamified instruction on learner outcomes in Mathematics. Project MATH-LARO holds promise as a responsive, teacher-informed initiative that may bridge the gap between traditional teaching and the evolving needs of 21st-century learners.

Keywords: Gamification, Mathematics Instruction, Game-Based Learning, Mixed-Methods Research, Instructional Strategies