

## Gamification Analytics Model for Teachers

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**Abstract.** *Previous studies have reported unexpected results concerning students' engagement, learning, and motivation in gamified learning systems despite the growing interest in applying gamification in the technology-enhanced learning context. A possible solution to avoid these unexpected outcomes is to use the gamification analytics approach, the data-driven process of monitoring and adapting gamification designs. Therefore, this work proposes the "gamification analytics model for teachers." According to this model, teachers can define interaction goals, monitor students' interaction with learning resources and gamification elements, and adapt the gamification design through missions for students who do not achieve the goals. A gamification analytics model-based tool, GamAnalytics, was developed, implementing the most well-rated design concepts validated by teachers through the speed dating method. Teachers evaluated the tool, and results showed a high acceptance and approval of the GamAnalytics tool by teachers. Furthermore, to investigate the impact of teachers' use of the proposed model through the GamAnalytics tool on students, we conducted a case study. The results suggest an improvement in students' engagement, learning outcomes, and a positive effect on students' motivation.*

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