

# Can gamification help in software testing education? Findings from an empirical study

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**Abstract.** Software testing is an essential knowledge area required by industry for software engineers. However, software engineering students often consider testing less appealing than designing or coding. Consequently, it is difficult to engage students to create effective tests. To encourage students, we explored the use of gamification and investigated whether this technique can help to improve the engagement and performance of software testing students. We conducted a controlled experiment to compare the engagement and performance of two groups of students that took an undergraduate software testing course in different academic years. The experimental group is formed by 135 students from the gamified course whereas the control group is formed by 100 students from the non-gamified course. The data collected were statistically analyzed to answer the research questions of this study. The results show that the students that participated in the gamification experience were more engaged and achieved a better performance. As an additional finding, the analysis of the results reveals that a key aspect to succeed is the gamification experience design. It is important to distribute the motivating stimulus provided by the gamification throughout the whole experience to engage students until the end. Given these results, we plan to readjust the gamification experience design to increase student engagement in the last stage of the experience, as well as to conduct a longitudinal study to evaluate the effects of gamification.

