Novel Perspectives in Academic Practice Strategy: Designing and Exploring Gamification Classroom Practice Approaches that Strategically Target Cognition, Student Motivation, and Engagement to Improve the Academic Performance of Underperforming Elementary School Students

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When it comes to students with low academic performance, repeated low scores can negatively contribute to social identity and form an inferiority complex leading to low motivation. This results in a negative recursive cycle of poor academics and low self-esteem that can last for the entirety of a student's education. However, contrary to what may seem to be the obvious source of this issue, the inhibitors of academic progression are not just simply a lack of capability. In fact, many elements responsible for a student's low performance are attributes also linked to engagement and cognition. These elements include attention to detail, focus, confidence, and eagerness to learn. The purpose of this study is to design and determine the effectiveness of alternative gamified math practice strategies aimed at academically underperforming students that target student motivation, engagement, and cognition. An immersive and competitive gamified environment was designed for students to enter. This environment was supported by online software as well. Students with the bottom 25% of math scores were pulled during their normal math practice time to complete exercises such as digital worksheets, cognitive training games, and collaborative/competitive activities. This occurred over a 6-week period. It was concluded that the implementation of gamified practice strategies designed in this study increased academic performance in mathematics for underperforming 4th-grade students by a factor that was statistically significant. This was measured in classroom test scores and engagement with school instructional software. It was also concluded that as students' exposure to the gamified strategy increased, the degree of improvement over the control group increased as well.

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